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MOTOR AGE

SIMPLICITY KEYNOTE OF THE PARIS SALON

PARIS, Dec. 5—Simplification is the keynote of the eleventh annual Paris salon. On the general lines of design European designers are pretty well of one opinion and there is no longer a discussion as to cone and disk clutches, shaft and chain-drive, high and low-tension ignition, selective and progressive gear changes, thermo-syphon and pump water circulation, pressed steel and armored wood frames, etc. While few designers have made any remarkable changes in their chassis, all of them have sought to simplify them to the greatest possible degree. It is with a view to simplification that low-tension ignition has been abandoned by all the large constructors who up to the present have been its strong supporters. The change has not been made with the object of allowing a dual ignition to be fitted easily, for the simple reason that dual ignitions are very rare exceptions. Designers are of the opinion that in the hands of an expert and for racing or demonstration purposes the low-tension system has an advantage; but for the ordinary user, who is not an expert at tuning up a car, the high-tension magneto is the best system. This is further proved by the fact that such firms as Brasier, Berliet, Dietrich and Mercedes use the high-tension system for small cars.

Sixty-six Sixes Shown

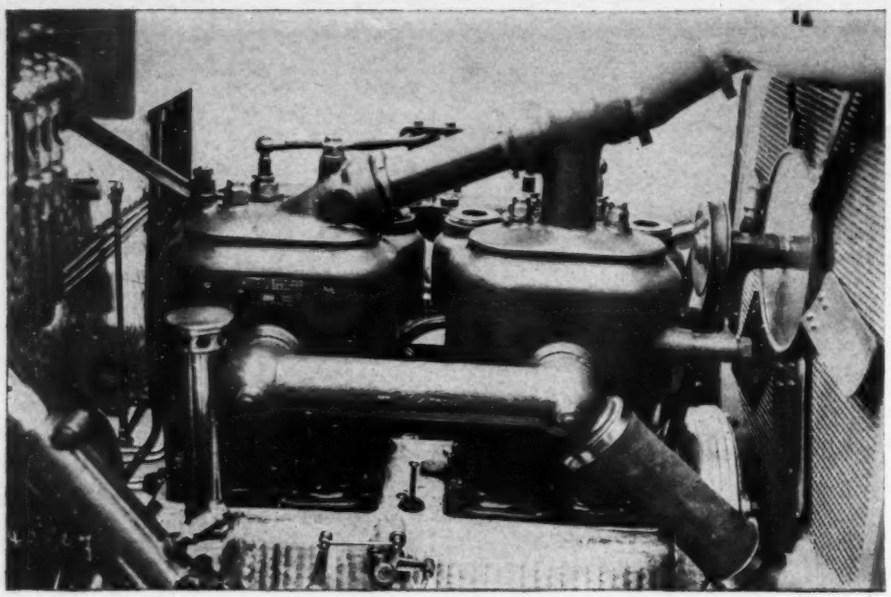
In the complete car class there are sixty-six six-cylinder engines shown by thirty-eight different firms. The size of the cylinders vary from 5½ inches bore and stroke on the Itala, to a 2⅘ by 4 inches on a Delaunay-Belleville. The most popular way of casting the cylinders is in groups of two, no fewer than forty-nine of the sixty-six being designed in this way. There are but four with two groups of three cylinders, and twelve with the cylinders cast separately. Delaunay-Belleville had the only six-cylinder engine in a single casting. An interesting feature on the new Panhard is that though the cylinders are cast separately they are bolted up in such a way that they form one group, the jacket of each cylinder slotting

In a nutshell the feature of the recent Paris salon was simplicity, few changes being noted in chassis, while it would seem as if low-tension ignition had received its death blow in Europe, it being claimed that high-tension is better in the hands of the inexperienced.

That the six-cylinder has not been abandoned is shown by the fact that thirty-eight different makers exhibited that type of car. Only one eight-cylinder was shown, that having been designed originally for aeronautical work.

A tendency noticeable was that designers have made a commendable effort to clear the dashboard. Two makers have encased the valves. Many voiturettes and small cars were shown.

Brilliantly Lighted Interior of the Paris Salon at Night



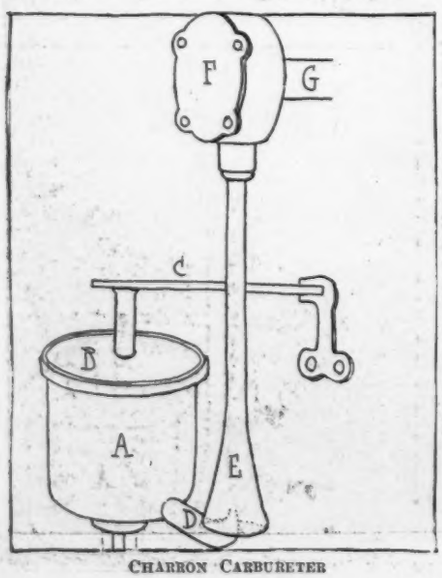
TWO-CYLINDER 10-12-HORSEPOWER BERLIET MOTOR

into that of its neighbor, and the whole being linked together by four bars passing through the waterjackets longitudinally. This gives the advantage of six separate cylinders with the reduced area and absence of water piping of a single casting.

In a large number of cases it has been possible to put a group of six cylinders under the same sized bonnet as for an equal powered car with four cylinders, in a number of cases manufacturers having sought to reduce the overall length to a minimum. There are a few examples of very elongated bonnets, and in one case, the Mors, the rear cylinder had been carried under the footboard to gain space.

High-Tension Magneto Popular

The popularity of high-tension magneto is fully demonstrated on the six-cylinder models. of the sixty-six cars exposed fifty-four have high-tension and only twelve low-tension ignition. These latter comprised in all cases the most powerful cars, and are presented by Mors, Mercedes, Itala, Brasier and Bollee. The most general order of firing the cylinders on the six-cylinder models is 1-5-3-6-2-4, which is the method adopted on forty-one of the total number of engines; in nine cases the order is 1-3-5-6-4-2, the other methods being 1-4-2-6-3-5, 1-2-3-6-5-4, and 1-2-4-6-5-3, which are about equally divided.



CHARRON CARBURETER

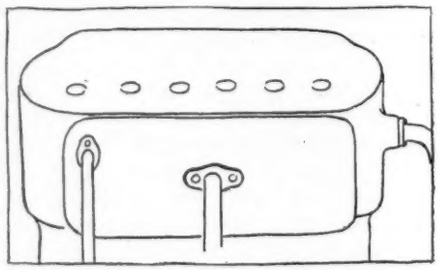
There is but one example of an eight-cylinder engine on a car chassis, and even this one has been first designed for aeroplane work and slightly strengthened for motor car service. The cylinders, of 110 by 120 millimeter bore and stroke, have copper jackets electrically welded on by a new process. Valves are all in pockets on one side of the engine, operated by a single camshaft. Carburation and ignition follow standard lines. A distinctive feature is a variation of the timing by the sliding of the camshaft in its bearings at the will of the driver.

In the desire for simplification this year, everything has been swept off the dashboard. The custom of carrying a battery of sightfeeds, a big lubricator, pumps. coil, oil, gas and water manometers, etc., in full view of the driver, has been gradually dying out, and it is now an exception to see anything more than a single sight feed and a switch. Panhard, for instance, who formerly made a dashboard display of a coil, lubricator and a few other articles, has simplified this portion of the car to a small sight feed and a switch. The coil is now under the bonnet, and the lubricator is placed at the other side of the dashboard. On the new Berliet models there is not even the sight feeds, a plain glass tube oil level being let into the dash, and the two sight feeds for the rear axle and the gearbox being under the hood. As this firm has abolished pressure-fed gas and oil tanks and force feed water circulation, the three indicators and the pump which formerly were necessary have been swept away.

On the Renault there is an interesting example of the stripping of the dashboard. No changes have been made in the system of lubrication, ignition or method of carrying gasoline tank, but instead of a large lubricator tank immediately in front of the driver there is now but a small sight feed covered over with a glass plate A flush with the dashboard, this being one of the neatest arrangements seen at the show. The oil tank filler B is immediately behind the radiator filler, the lubricator having simply been removed from the rear to the front of the board. It was noticed that of all the self-starters which attracted so much attention at the show last year the only survivor is the one designed by Louis Renault, and shown on all the big cars of his make. The small self-starter, operated by the foot, was not in evidence.

Simplification of Piping

A simplification of all piping, whether for oil, gas inlet or exhaust, is a notable feature. One of the most striking in this respect is seen on the new Charron two and four-cylinder cars. The float chamber A, of the usual type, has its cover B lai don the box by a flange only, and held in position by a blade spring C attached to a vertical spindle. The top of the box comes off by merely lifting up the blade. Projecting from the float chamber is a tube D, the up-turned end of which comprises the nozzle. Fitting over it is a plain copper tubeE with a bell-mouthed bottom, the upper end of which passes into the mixing chamber F attached to the inlet manifold; thus the intake piping amounts to a 6-inch length of copper tube G held by a single screw. As the exhaust manifold is cast with the cylinders and the inlet and outlets for the circulating water are each cast in one piece connected up to the top and bottom of the dashboard radiator by a short length of hose, there practically is no piping on the car. With the magneto at the front of the engine and the four electric cables contained in a metal tube, the maximum of accessibility is obtained.



DELAHAYE ENCLOSED VALVES

Simplifying Water Piping

It is noticed that each wire has a number attached to it, indicating the cylinder to which it leads. This method of simplifying the water piping as shown on the Charron, also is to be found in a number of other new cars, a notable example being a Delaunay-Belleville six-cylinder with the water outlet in one piece screwed

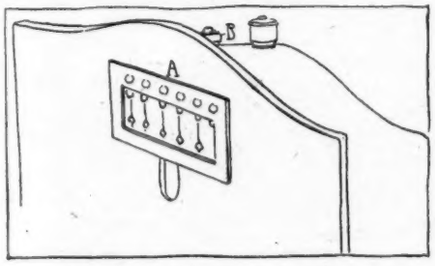
down to the cylinder head, and with a single connection to the top of the radiator.

Engine Accessibility Increased

Increased engine accessibility by mounting the radiator on the dash board is no longer an exclusive Renault feature, several of the new cars having adopted it. A two-cylinder Berliet intended for taxicab and town work had been fitted in this way, with a mass of plain copper tubes uniting an upper and lower tank on the dashboard. Several smaller firms have more or less slavishly copied the same idea. On the new Charron the dashboard radiator is formed of gilled tubes, uniting in an upper and lower tank, but instead of being carried right across the car, the central position, immediately behind the engine, is occupied by a fan driven by belt from the mainshaft. This arrangement adds to the width of the radiator, causing it to be carried out to the full width of the side members, though at this point the frame already has been inswept to give the desired angle.

Encase the Valves

Delahaye and Leon Bollee encase the valves by means of a sheet metal plate secured in each case by a single clip, the



SIGHTLY DASH ON THE RENAULT

general arrangement being somewhat similar to that on the Winton. When, as on the Delahaye, there is a single length of pipe only for the gas intake, the exhaust and the water inlet, an exceptionally clean type of engine is obtained.

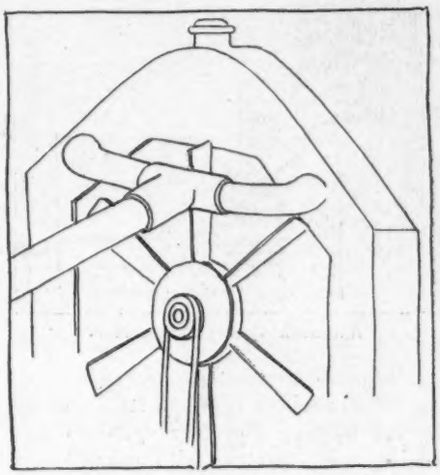
Magnetos on Taxicabs

The influence of London police regulations on motor car design is shown on all the Darracq models. On the original taxicab model so well known in New York, the magneto is placed on the same side as the carbureter, and carried in an out of the way position under the exhaust manifold. The London authorities, however, now refuse to pass any car for public service unless the carbureter is away from the magneto, with the result that the Darracq company has been obliged to put the magneto to the opposite side of the engine, carrying it on a special bracket cast with the crankcase, and held down under a projecting arm from the cylinders. The improvement having to be made for the taxicab, the opportunity was taken of applying it to all models. As a number of French firms have obtained or are seeking the London taxicab business, the magneto and carbureter on the same side is an exception.

Final drive by propeller shaft is more common than ever before, for the simple reason that more small cars are built, and European designers are of the opinion that for low and moderate powers the shaft is preferable. For the highest powered cars, however, final drive by side chains maintains its position, the opinion being that at highest speeds and for heavy cars the chain is much more satisfactory than the cardan. It is an opinion that has grown as the result of racing experience. There is a tendency to get away from the use of a torque rod even on cars of comparatively high power. There is an example in one of the new Renault models, a car of 20-30 horsepower. On the other models from the Billancourt factory tubular torque stays are employed in place of the pressed steel one formerly fitted. The only exception is the small runabout, which had no stays at all. A more general tendency is to strengthen the casing of the propeller shaft, letting it perform the functions of the torque stay. A neat arrangement on the shaft-driven Delahaye is the carrying of distance rods attached to the same hanger as the forward end of the rear spring.

Small Cars and Voiturettes

Undoubtedly the most interesting work of the show is in the small car and voiturette classes. It is rather difficult to draw a distinct line of demarcation between what is a small car and what is a voiturette, but in the former would certainly be classed the new two and four-cylinder models from such firms as Renault, Brasier, Berliet, Dietrich, Charron, Delahaye, and others, while the voiturettes have as their chief examples such cars as the single-cylinder Sizaire-Naudin, Aries, Werner, Delage, etc. Each of the large firm without an exception has produced a

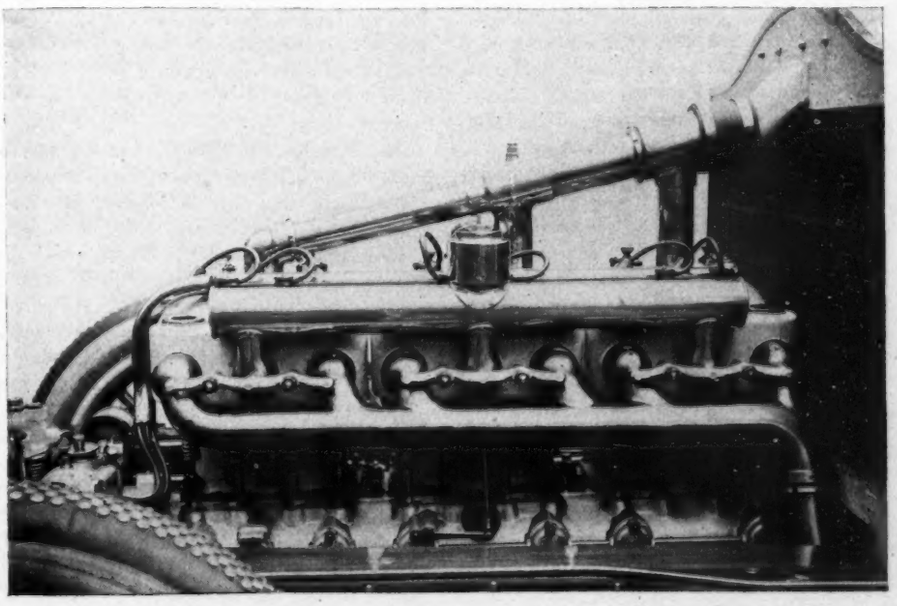


WATER PIPING ON BERLIET

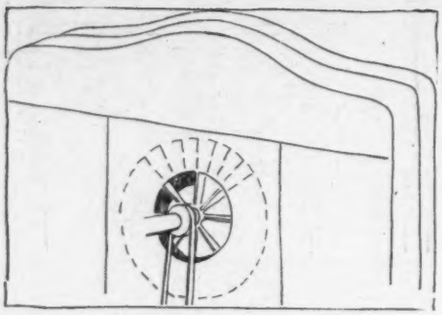
little two-cylinder car of about 10-horsepower, capable of light taxicab work, or for use as runabouts. Thus Panhard, in the old school, comes forth with a two-cylinder of this type, with the cylinders in one casting, and the engine forward and bolted direct to the side members of the frame. Valves are all on one side, the oil tank is carried between the pair of arms on the right-hand side of the engine, and the carbureter between the corresponding pair on the opposite side; the magneto—a Nilmelior high-tension—is in front. Water circulation is by thermo-syphon, with no fan behind the gilled tube radiator; lubrication is assured by a pump driven off the rear of the camshaft, the flow being through a sight-feed on the dashboard. Engine control is entirely by pedal, there being no levers on the steering wheel. Cone clutch is provided; there are three sliding speeds and reverse, and final drive by cardan shaft. Rear suspension is by three-quarter ellipties.

Bayard-Clement Originality

Bayard-Clement had one of the smallest and most original of four-cylinder cars,



SIX-CYLINDER MOTOR USED BY RENAULT



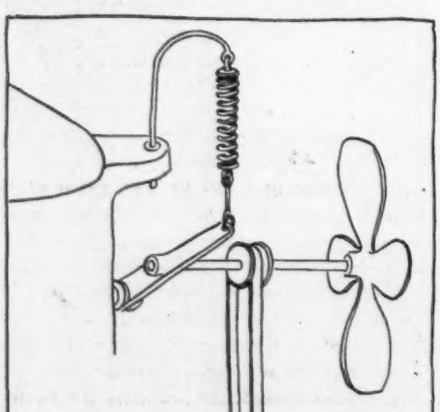
RADIATOR DASH ON CHARRON

the cylinder measurements being only 65 by 100 millimeters bore and stroke, or 2.5 by 3.9 inches. The four cylinders and engine base, together with exhaust and intake manifold, are a single casting, the crankshaft naturally being attached to the upper portion, for no lower casting exists, the oil pan being formed by a sheet metal casting fastened by screws along each side and secured at each end by a steel band drawn tight by a single screw and nut. Valves are all on one side, with spark plugs immediately over the inlet valves, and magneto at the front of the engine. The mounting of the engine is somewhat original, there being a couple of radiating arms both front and rear, each one terminating in an eye hole, through which passed a steel tube with suitable flattened ends to allow of it being bolted to the side members of the frame. Cooling is by thermo-syphon, with a special type of radiator consisting of about forty flat copper tubes uniting an upper and a lower tank. The thin end of the tube is presented forward, and in order to break up the current of air they are faced by a metal grating, giving the car the appearance of having a cellular radiator.

The same firm has produced for the first time a single-cylinder car on the same general lines as the four, but without the sheet metal base to the crankchamber. In both cases sliding gear transmission of the straight through type is employed, and final drive is secured by means of a propeller shaft.

Unique Motobloc Feature

Motobloc showed the only single-cylinder engine with gearbox and crankcase in a unit, with the engine and transmission

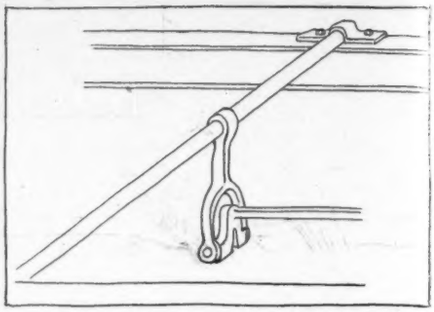


AUTOMATIC BELT TIGHTENER ON DE DIETRICH

forming a single block, as on the larger cars by the same firm. A feature of the little car is the mounting of the honeycomb radiator on hinged bearings—with suitable oil-caps attached—to prevent the straining of the tubes on a twisting of the frame.

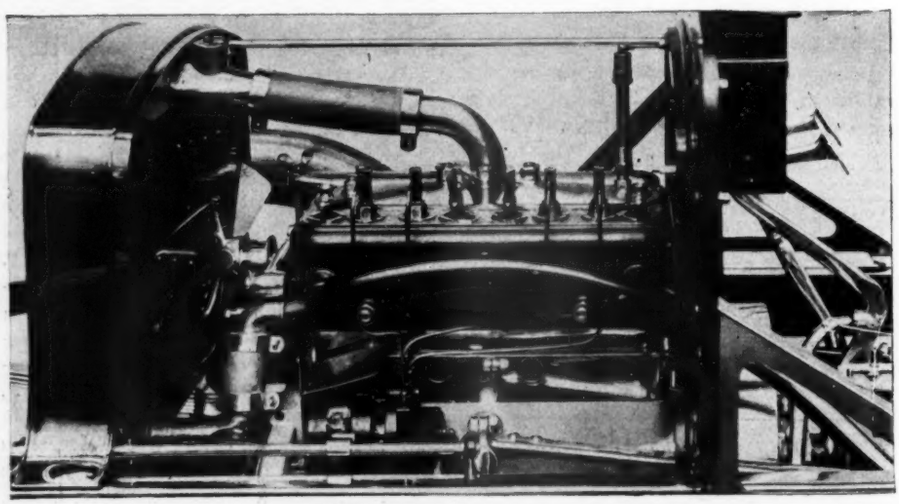
Examples of Voiturettes

In dealing with the voiturettes one enters to a certain extent the realm of the assembled car, for many of the firms in this class have not the resources necessary for producing an entire vehicle. In the majority of cases a de Dion or an Aster single-cylinder engine, with high-tension magneto and thermo-syphon water circulation is employed. Such firms as Sizaire-Naudin, and Chenard-Walcker, produce a vehicle entirely of their own manufacture. There is a disinclination on the part of all the voiturette builders to reduce the size of the bonnet in proportion to the size of the engine it covers, with the result that there is a considerable amount of waste space. In several cases the unoccupied



ROCHET-SCHNEIDER GEAR SHIFTER

four-cylinder water-cooled engine without radiator. On the front of the dashboard is a large water tank, through which the cooling water flows by thermo-syphon circulation. An air pump, driven off the rear end of the camshaft, is connected up by suitable piping to the point at which the cool water entered the cylinders, and there discharges its jet of cold air, cooling the water and at the same time driving it into the jackets.



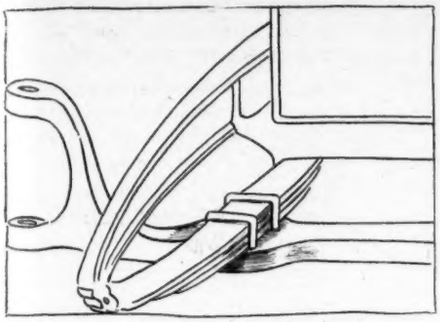
EXAMPLE OF 16-18-HORSEPOWER MOTOR WITH CYLINDERS EN BLOC

area between the front of the dashboard and the engine is taken advantage of to house the gasoline, oil and water tanks, and in one case to provide a chest for the most commonly used tools carried on the modern motor car.

The Henriot's company's stand supplies more of the distinct departures from standard design than any other in the show. Among the novelties are a couple of air-cooled engines, each provided with a couple of fans on the valve side of the engine, driven in one case by bevel gear and upright spindle from the camshaft, and the other by belts from a pulley operated by means of bevel gear off the crankshaft. The single pulley, with a double grooved face is connected by means of a belt to transverse shafts, passing respectively between the first and second and third and fourth cylinders, the fan being attached to the opposite end of the shaft. A planetary transmission contained within the flywheel, is attached to the same car. On the same stand is a

Knight's patent does not attract the same amount of attention here as at London, the Frenchman evidently having less faith in its ultimate adoption than the Britishers. Minerva exhibits one of these models, constructed in its Belgian factory, and the other is shown by Gem on a gasoline electric factory, the motor being obtained from the English Daimler Co. Gasoline-electric firms at the show are but two in number, the Gem and the V. A. T. E., the latter showing small cars with a single and two-cylinder engine driving a dynamo. Steam has not a single representative in the big hall.

There is evidence that a large amount of serious work is being undertaken by European constructors towards the development of a light-weight engine for aeronautical work. The new Renault and the seven-cylinder Bayard-Clement are not shown, but doubtless will be brought forward for the second salon, devoted to commercial vehicles and aerial navigation. Gobron displays one of the most interest-

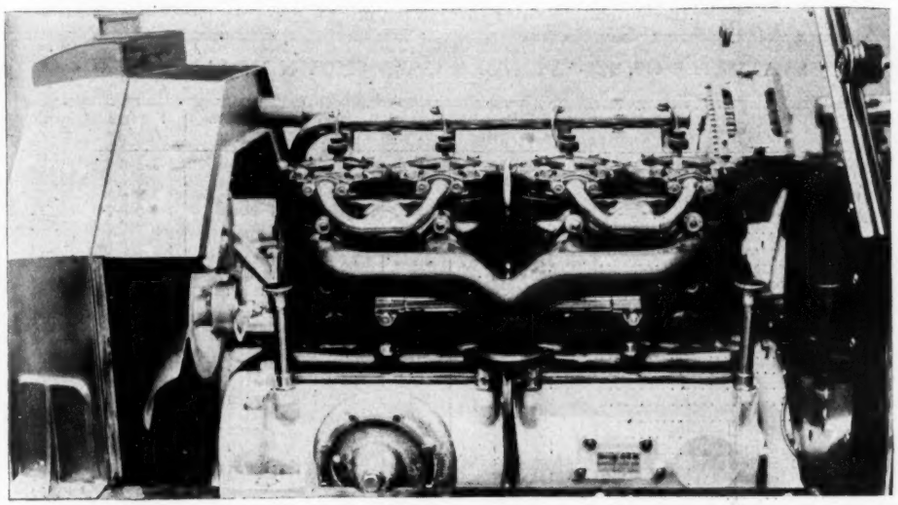


FIAT BROADENED AXLE AT SPRING SEAT

ing of the light weight engines with an eight-cylinder sixteen-piston one developing 80 horsepower at 1,500 revolutions, and weighing complete, with two magnetos, 460 pounds.

Eight-Cylinder Motor

The cylinders form an X, each pair being placed in relation to its neighbor at an angle of 90 degrees. A two-throw crankshaft is employed, to one pin of which are connected up the eight pistons



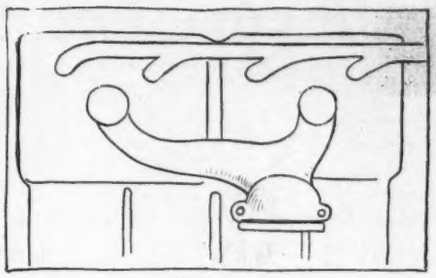
KNIGHT MOTOR AS FITTED TO THE GEM

in one plane, and to the other the eight pistons in the opposite plane. It should be pointed out that in the Gobron engine there are two pistons per cylinder, the combustion chamber being between the two. It is a principle that has been used by the maker for years with very satisfactory results, the engine being regarded now as nothing more than a long-stroke one. The cylinders are water cooled, circulation being assured by a pump working off the crankshaft, and the water flowing through copper jackets surrounding the cylinders. Inlet valves are automatic, the exhaust mechanically operated by means of an oscillating arm for each pair of cylinders, there being no gears whatever for the valve mechanism. There are two magnetos, each one feeding four cylinders. This arrangement has been adopted in order to avoid the high speed which would be necessary for a single magneto supplying the eight cylinders of an engine revolving at 1,500 revolutions a minute, and also as a measure of security. Should one magneto fail, the engine could still run on the other with four cylinders sufficiently long to allow the aeroplane to be brought safely to earth. Lubrication, usually a difficult matter on engines of this type, is obtained by means of a pump on the outside of the engine feeding oil at the heads of the cylinders that are uppermost. The oil runs down to the base of the opposite cylinders, is there collected and again driven to the top. The carbureter is of the ordinary type.

Light-Weight Rotary Engine

A light weight rotary engine is shown by the Gnome company. The engine, which is constructed entirely of nickel steel, has four cylinders placed at equal intervals round a circular crankcase, fitted with radiating flanges, and revolving round a fixed crankshaft, cooling being assured by their passage through the air. The crankshaft is hollow, carburation being through its center, and exhaust through mechanically-operated valves in the cylinder heads. High-tension ignition is employed with a Bosch magneto.

Pipe, the Belgian firm, presents an eight-cylinder air-cooled engine of 3.9 bore and stroke, declared to develop 70 horsepower, and weighing complete 236 pounds. The mechanically-operated valves are placed in the cylinder head and operated by overhead rocker arms from a single camshaft. Each valve performs both the functions of inlet and exhaust, the first position of the valve opening the inlet, the second position closing it by means of a sliding sleeve and opening the exhaust. Each line of cylinders is surrounded by a sheet aluminum jacket with a bell bottom, a current of air being drawn in at the base of the cylinder passing upwards to the head into a collector, and outletting at the rear. The crankshaft is fitted with ball bearings at each end and the center combustion chambers are hemispheric, ignition is by high-tension magneto, and an ordinary type of carbureter, carried in the angle formed by the two lines of cylinders is fitted.



TOP OF BERLIET CARBURETER

In the voiturette class a new model attracting a great deal of interest is the new Truffault chassis, equipped with a mono-cylinder Aster motor 105 by 120 millimeters. There is no transmission box, but a low gear is provided for starting and hill-climbing and a reverse. The other variations of speeds are taken care of by the motor, which, although a single cylinder, is very flexible. The suspension is by concentric vertical springs, a departure from the adopted standard of flat elliptic or semi-elliptic springs which has for so long been considered the orthodox style.

Variety of Aster Motors

One of the most notable stands is the one on which Aster motors are shown, the engines ranging from 15 to 30 horsepower for shaft-drive chassis and from 35 to 50 horsepower for chain-drive. Of especially strong interest is the Aster voiturette motor of the one-cylinder type of 105 by 120 millimeters, rated at 9 horsepower at 1,500 revolutions. It is a water-cooled motor, either by thermo-siphon or pump circulation. The valves are mechanical, the lubrication is automatic, high-tension ignition is used, with provision for magneto and jump spark by storage battery. Another of the Aster motors is the four-cylinder engine, cast en bloc. It is 10-12 horsepower, 75 by 110 millimeters, bore and stroke, and is water-cooled and has automatic lubrication and high-tension magneto. The four-cylinder monobloc motor of 12-16 horsepower at 1,500 revolutions is 84 by 110 millimeters and is fitted with thermo-syphon water circulation. It has a high-tension magneto, with provision for a double system of ignition and water pump if desired. As in the other models, the lubrication is automatic. The 24-30 horsepower is a four-cylinder, 105 by 140 engine, with the cylinders cast in pairs and is identical in every way with the smaller ones. In the commercial motor line the Aster shows two models. A two-cylinder cast separate and 130 by 140, rated at 20 horsepower for a 3-ton chassis, and a four-cylinder, 130 by 140 millimeter, cast in pairs, of 40 horsepower for chassis over 3 tons. The Aster also shows its new carbureters, the Omnivore, using illuminating oil, for which is claimed an economy of over 40 per cent in the running expense of the motors.

The most remarkable model of the Berliet line exhibited is the 12 horsepower chassis,

with a four-cylinder, 70 by 100 engine, with high-tension magneto, pressure lubrication, and thermo-syphon water circulation. This little model has all the well known features of the Berliet cars. A single camshaft operates all the valves placed on one side and the final drive is by shaft. The pressure lubrication is simple and positive. An oil reservoir is placed under the hood with a visible level. Every part of the motor and the crankshaft is lubricated positively and automatically. All the operator has to attend to is the replenishing of the oil supply when the reservoir is empty, just as with water and oil.

Two New Brasiers

Two new Brasier models are worthy of special mention. The two-cylinder, 90 by 120 millimeter, and the four-cylinder monobloc, 67 by 110, are both mounted on identical chassis. A departure from the low-tension ignition used in the past on the products of the Brasier factory is noted in these new models, both being equipped with Bosch high-tension magnetos. All the valves are mechanically operated. The cooling is by thermo-syphon through a flat tube radiator and by fan. The lubrication is by pump through a two-sight feed device on the dash. The carbureter is horizontal and automatic. The clutch is cone, leather-faced. The gearbox has three speeds forward and reverse, with direct on high. The final drive is by shaft. The steering knuckles, drag links, distance rods and all parts of the steering gear are identical in size and design with those used in the big Brasier models. Two sets of brakes are provided, one on the driving shaft and the other on the hubs of the rear wheels. The frame is pressed steel and the motor rests on an under frame. The wheels are all 30 by 3 inches.

De Dion has Nothing New

De Dion models range from the one-cylinder, 8 horsepower, to the four-cylinder, 30 horsepower. Nothing new is seen on the de Dions. The new single-cylinder taxicab of 8 horsepower is the center of attraction.

Five very interesting models are shown at the Panhard-Levassor stand. In addition to the two-cylinder car, described elsewhere in this article there is an 18-horsepower four-cylinder chassis, with separately cast cylinders. The crankshaft rests on five ball bearings. The carbureter is automatic and a high-tension magneto is used. The water circulation is by centrifugal pump. There are four speeds. Besides the regular brake equipment the motor acts as an air brake by means of a clever disposition of the exhaust valves. On a chassis identical with the one described above, save for a slight difference in the gearset, is shown a luxurious limousine of the Queen Amelica type. This particular limousine can be opened and has five interior seats. It can be used for town or touring purposes. A five-seated landaulet on an 18-horsepower chassis and a 30-horsepower six-cylinder also are shown. The motor of the six-cylinder car has separately-cast cylinders, but blocked together so it is very compact. The carbureter, cooling and lubrication are as on the other models. Ignition is high-tension and final drive by chains, which still are retained by Panhard.

Pipe Is Original

The new 18-horsepower model Pipe is one of the really mechanical features of the present show. The motor is of the four-cylinder type, 90 by 105 millimeters, and is rated at 18 horsepower at 1,500 revolutions. This motor develops 30 horsepower. The combustion chamber is semi-spherical and the valves overhead. The rocking arms are actuated by a single camshaft. The exhaust valve is water-jacketed around its seat. Connecting rods and pistons are very light. The crankshaft rests on three ball bearings. The lubrication is by pump and a centrifugal water pump is used. The Pipe carbureter is automatic and water-jacketed. The float level and the spray nozzle level are constant. An aluminum piston inside the intake pipe regulates the amount of fuel fed to the motor. The clutch is disk in a tight oil case. There are three speeds with direct drive on high. The secondary shaft connects direct through pinions to the differential level for the first and second speeds. The third is direct. This eliminates all noises from the gearbox. Both transmission shafts have ball bearings. The final drive is by chains enclosed in oil-tight cases, which fit the chains. They can be adjusted easily. The steering is by spiral gear and sector. The service brake acts on a drum on the propeller shaft and the emergency brakes on the hubs of the rear wheels.

Two New Rochet-Schneiders

Of the numerous four and six-cylinder models shown by Rochet-Schneider two are entirely new—the 12-horsepower and the 18-24-horsepower, both shaft drive. The 12-horsepower is four-cylinder 80 by 120 millimeters and the 24-horsepower is 105 by 140. Both are equipped with high-tension magnetos. The first has three speeds, the second four. In construction and design there is nothing to distinguish them from the other well known Rochet-Schneider models. The 12-horsepower is intended for a town car and the 24 for touring. Both are good-looking creations.

STATISTICS OF SIX-CYLINDER CARS SHOWN IN PARIS SALON

Car	Bore & Stroke in m. m.	Rated H. P.	Actual H. P.	Form of Motors	Firing Order	Ignition
Aries	84×120	15-25	34	Sep.	1-3-5-6-4-2	H. T.
Aries	105×130	40-50	58	Sep.	1-3-5-6-4-2	H. T.
Bayard-Clement	88×120	25	37	Pairs	1-5-3-6-2-4	H. T.
Bayard-Clement	100×120	30	50	Pairs	1-5-3-6-2-4	H. T.
Berliet	100×140	40	54	Pairs	1-5-3-6-2-4	H. T.
Berliet	120×140	60	84	Pairs	1-5-3-6-2-4	L. T.
Bollee	108×130	30-50	57	Pairs	1-4-2-6-3-5	L. T.
Bollee	125×150	60	96	Pairs	1-4-2-6-3-5	L. T.
Bolle	130×150	75	105	Pairs	1-4-2-6-3-5	L. T.
Brasier	90×120	34	40	Pairs	1-5-3-6-2-4	H. T.
Brasier	112×130	50	68	Pairs	1-5-3-6-2-4	L. T.
La Buire	80×120	16	28	Pairs	1-5-3-6-2-4	H. T.
La Buire	92×120	24	40	Pairs	1-5-3-6-2-4	H. T.
La Buire	102×130	30	53	Pairs	1-5-3-6-2-4	H. T.
La Buire	120×140	40	84	Pairs	1-5-3-6-2-4	H. T.
Buchet	76×100	18	24	Pairs	1-2-3-6-5-4	H. T.
Buchet	85×110	22	33	Pairs	1-2-3-6-5-4	H. T.
Clement-Gladiator	90×120	18-24	39	Pairs	1-5-3-6-2-4	H. T.
Clement-Gladiator	120×140	60	84	Pairs	1-5-3-6-2-4	H. T.
Cottin-Desgouttes	80×120	16	30	Pairs	1-5-3-6-2-4	H. T.
Cottin-Desgouttes	120×140	45	84	Pairs	1-5-3-6-2-4	L. T.
Darracq	120×120	40-50	76	Pairs	1-5-3-6-2-4	H. T.
Delaunay-Belleville	72×105	10	20	Monobloc	1-2-4-6-5-3	H. T.
Delaunay-Belleville	85×120	15	32	Cast in Three	1-2-4-6-5-3	H. T.
Delaunay-Belleville	98×122	25	51	Pairs	1-2-4-6-5-3	H. T.
Delaunay-Belleville	115×130	40	74	Sep.	1-2-4-6-5-3	H. T.
Lorraine-Dietrich	80×120	15	28	Cast in Three	1-5-3-6-2-4	H. T.
Lorraine-Dietrich	130×150	70	105	Pairs	1-5-3-6-2-4	H. T.
Fiat	110×130	30-50	65	Pairs	1-5-3-6-2-4	H. T.
Fiat	125×150	50-60	96	Pairs	1-5-3-6-2-4	H. T.
Florentia	100×140	28-38	55	Pairs	1-2-3-6-5-4	H. T.
Germain	86×110	14-20	33	Sep.	1-5-3-6-2-4	H. T.
Germain	92×110	18-22	39	Sep.	1-5-3-6-2-4	H. T.
Germain	102×110	40	50	Sep.	1-5-3-6-2-4	H. T.
Germain	120×130	60-70	82	Sep.	1-5-3-6-2-4	H. T.
Gobron	112×200	70	92	Pairs	1-5-4-6-2-3	H. T.
Hotchkiss	120×140	50-60	84	Pairs	1-5-3-6-2-4	H. T.
Itala	130×140	60	100	Pairs	1-2-3-6-5-4	L. T.
Itala	140×140	75	120	Pairs	1-2-3-6-5-4	L. T.
Lancia	90×100	30	35	Pairs	1-5-3-6-2-4	H. T.
Mercedes	120×140	65	84	Pairs	1-5-3-6-2-4	L. T.
Mercedes	120×150	75	88	Pairs	1-5-3-6-2-4	L. T.
Milde-Gailliardet	120×130	35-40	81	Pairs	1-2-3-6-5-4	H. T.
Minerva	105×120	40	56	Pairs	1-5-3-6-2-4	H. T.
Mors	114×150	50	77	Pairs	1-5-3-6-2-4 1-2-3-6-5-4	L. T. L. T.
Panhard-Levassor	90×130	30	42	Sep.	1-5-3-6-2-4	H. T.
Panhard-Levassor	130×140	60	102	Sep.	1-5-3-6-2-4	H. T.
Piccard-Pictet	100×120	28	51	Pairs	1-5-3-6-2-4	H. T.
Renault	120×140	50-60	84	Pairs	1-5-3-6-2-4	H. T.
Rochet-Schneider	104×140	30	62	Pairs	1-5-3-6-2-4	H. T.
Rochet-Schneider	120×160	45	90	Pairs	1-5-3-6-2-4	H. T.
Rossel	110×110	30-40	58	Pairs	1-3-5-6-4-2	H. T.
Rossel	135×140	70-80	110	Pairs	1-3-5-6-4-2	H. T.
Porthos	100×110	25-36	48	Sep.	1-3-5-6-4-2	H. T.
Porthos	120×140	50-60	84	Sep.	1-3-5-6-4-2	H. T.
Georges Roy	110×150	60	72	Pairs	1-5-3-6-2-4	H. T.
San-Giorgio	100×160	30-40	45	Pairs	1-3-5-6-4-2	H. T.
San-Giorgio	100×127	40-50	52	Pairs	1-3-5-6-4-2	H. T.
San-Giorgio	112×127	50-60	65	Pairs	1-3-5-6-4-2	H. T.
S. C. A. R	100×130	35	51	Pairs	1-5-3-6-2-4	H. T.
S. P. A	130×145	60	104	Pairs	1-5-3-6-2-4	H. T.
Siddeley	118×127	50	78	Pairs	1-5-3-6-2-4	H. T.
Unic	85×120	25	34	Cast in Three	1-4-2-6-3-5	H. T.
Sultan-Lethimonnier	75×110	15	24	Pairs	1-5-3-6-2-4	H. T.

DETROIT WILL MAKE HALF THE 1909 OUTPUT

Estimated Production of Combined Motor Car Plants in City of Straits is Close to 50,000

DETROIT, MICH., Dec. 15—Detroit will manufacture more motor cars for the 1909 market than any other city in the country, in fact, a conservative estimate of the output of Detroit, Pontiac and Lansing, all Michigan centers, shows that they will produce 50 per cent of the motor cars made in the United States for the 1909 market. This does not mean that this output will be manufactured between January 1 and December 31, 1909, inclusive, but that its output of cars for the 1909 market will attain these proportions. Looking upon these three centers as one because of their adjacent locations, the probable output comes close to 50,000 machines, and if the entire country produces 100,000 cars, the anticipations of even the optimists will have been realized. If the figures as announced by different Detroit makers were obtained the output from the city of the straits and its two adjacent little sister cities would be over 60,000, but it is expected that announced figures will prove to be at least 12,500 too high, it is thought.

Face Herculean Task

To the person who has not recently visited the many Detroit factories the task of turning out so many cars will appear herculean, and so it is, but increased factory space, banks of new machinery, night shifts and the multiple workmanship of the present day factory make a 50,000 output quite possible. Detroit has been the pioneer in many factory schemes and car outputs previously deemed impossible, but the successful culmination of these has established a feeling of confidence in the public mind regarding the actual status of its factories. The probable Detroit output is based on figures given out by different factories from time to time, as well as from the actual specifications of cars for the 1909 market.

Of the busy group the Packard stands first, not from a numerical output but from its nature and the number combined. The company is at present adding a big powerhouse to its already commodious plant; a new machine shop is being constructed; a new lumber-preserving room soon will be completed, and then this immense plant will cover 800,000 square feet of floor space. With the increased factory facilities the truck department will to an extent be segregated. That the company is running far ahead of previous records in the output for next year is evident, because by December 1, 1907, it had 548 cars delivered and on December 1, 1908, 904 of the 1909 output had left the factory. At this rate of manufacture the optimist would be forgiven for placing the Packard output at 2,300 cars. The factory efforts are being directed in making Packard Thirties and Eighteens, of which 60 per cent will be of the former type.

The Chalmers-Detroit concern is one of the prodigies of this city of the straits, because of its spectacular entry into the industry, coupled with the stupendous strides it has since made. What its output for 1909 will be can be partially gauged by the output of 881 cars delivered up to November 31 and the expected delivery of 1,000 by January 1. This is an output of forty cars a day. The present plans of the company are to build 2,500 small cars and 550 of the Forties, a total of 3,050 machines. The fact that one-third of the output will have left the factory before the new year is an excellent indication of the early completion of 1909 lines.

Henry Ford's Big Ambition

It is self-evident that many of the factory estimates on output will not be attained; not because the makers put them up originally with the sole purpose in mind of knocking them down at their convenience later, but simply because circumstances entirely beyond their control have made it impossible for the men who made the calculations to carry them out to the letter. On the other hand, some of the estimates actually have been increased by substantial percentages, while in others their formulators have seen no reason to lose faith in their ability to produce the machines in sufficient numbers to uphold their predictions. One of these is Henry Ford, who firmly believes that his company will be able to turn out 25,000 of the new model Fords between January 1, 1909, and the same date a year later. But Mr. Ford's belief is based almost wholly upon his ability to get the new Ford plant in shape by February 1 at the latest. No matter how small it is, those who have had experience along this line, know that the task of building a factory and installing the machinery in it is one that is practically never accomplished according to schedule, and when the vast dimensions of the new Ford building are taken into account, together with the tremendous amount of equipment that it necessitates, it will be evident that, as is the case with most of the others, the cause of the Ford shrinkage will be delay in getting the manufacturing facilities in shape.

Busy At Cadillac Plant

In refiguring the original estimate of 10,000 cars over, a cut of 10 per cent was made, bringing the number of Cadillacs to be turned out down to 9,000 cars, and just how closely the production of these machines has been calculated will be evident from the manner in which deliveries have coincided with the original plans. Up to December 1 the schedule called for 300 cars, all of which left the plant by that date; from that time on the figure was fifteen cars a day, and that has been averaged without variation right along. For January the production has been set at twenty cars a day and the same figure will be adhered to during February, while for March it will be increased by 50 per cent, making the average daily production thirty cars. But by that time the capacity for producing will have been brought up to thirty-five a day, and ultimately the number turned out every working day will exceed forty machines.

How great a force is necessary to make this possible may be gauged from the fact that at present there are 2,500 men working in the Cadillac factory in the day shift and between 400 and 500 at night, bringing the total close to 3,000 men. The night force is being added to as fast as the organization can absorb them, and by the end of the next month or so it is planned to make the number on night work equal to half that of the normal day force, or a total of 4,000 men. This is but one plant and strikingly shows what the motor industry means to Detroit.

At the Regal plant 1909 manufacture is moving along nicely, one car a day being turned out. This low rate is due to certain delays connected with new models which soon will be overcome and a 1909 output of 2,000 cars and 100 taxicabs is aimed at. The main efforts of the factory will be directed toward the 30-horsepower chassis, which will be fitted with three, four or five-passenger bodies.

Herreshoff Will Make 350

Mention must be made here of the Herreshoff car, 350 of which it is expected will be manufactured. The Blomstrom factory is expected to turn out close to 2,000 machines, and the output of the de Luxe will be considerable. In the Grabowsky commercial car considerable numerical strength will be given the Detroit field. The Rapid company at Pontiac has matured careful plans for its two and four-cylinder cars to be built in large quantities. The Welch car, also built at Pontiac, will be turned out 350 or 500 strong. At Lansing the Reo factory is a beehive, with everything rushing on the 7,000 output for next year. The Oldsmobile plant is working on a 3,250 output, 2,000 being 22-horsepower cars, 1,000 of the regular model and 250 of six-cylinder machines. Deliveries have started on the 22-horsepower machine.

MOTOR CAR TARIFF STUDIED BY THE MAKERS

NEW YORK, Dec. 14—Seeking to throw more light on the tariff question as relating to motor cars the committee of motor car manufacturers having charge of that matter held a meeting in New York Saturday for the purpose of completing its brief, which will be submitted to the ways and means committee at Washington. The motor car makers feel that the question of the tariff does not concern the manufacturers any more than it does labor, and expect to prove that to the satisfaction of the authorities. It was reported at the meeting that certain statements had been made which might tend to give a false impression as to the attitude of the motor car builders in this country toward tariff revision. In this connection Benjamin Briscoe, president of the Maxwell-Briscoe Motor Co. and a member of the motor car manufacturers tariff committee, filed a copy of a telegram sent to H. E. Miles of the National Association of Manufacturers, relative to statements made by him recently, as follows:

"Knowing that an adequate duty to protect wages of American workmen, as against the existing low rate of wages in European motor car factories, which is admitted to be less than 50 per cent of the American rate, is in practically universal demand by the American motor car manufacturers, I insist that your statement before the ways and means committee implying you had information that a considerable portion of the industry was favorable to a tariff reduction on motor cars, is unfair, because it is not in accordance with the facts, and you should know it. I challenge you to produce any and all the telegrams you referred to, substantiating your representations. I cannot believe that you would deliberately distort the facts, or that you intend purposely to convey a wrong impression, and I therefore await with interest a statement from you that will be supported by facts."

Benjamin Eriscoe's Views

In an interview yesterday Mr. Briscoe stated that it was the desire of his committee to furnish all needed data that will enable the ways and means committee to understand the subject thoroughly, and be in a position to rule on it fairly.

"The motor car makers," said Mr. Briscoe, "have no desire to ask for an unfair rate of tariff, or for any special treatment. While the figures of wages in this country and Europe indicate that 60 per cent duty would be necessary for adequate protection in the matter of labor, they do not ask for anything more than the existing rate of 45 per cent. As motor cars have come into use since the passage of the Dingley bill, they now come in under the classification of manufactured metals, and it is our desire to have them properly classified under the heading of 'motor cars and parts thereof.'

"It is our belief that the tariff on motor cars should be one to protect the American workman against the low wages paid abroad. This is in accordance with the principles actuating a protective tariff, and is consistent with the doctrine of the party now in power. There can be no dispute as to the meaning of these principles and this doctrine, as set forth in the platform of the Republican party, and voiced time and again by President-elect Taft, who said 'that the Republican party is unequivocally for a revision of the tariff by a special session of congress immediately following the inauguration of the next president,' and laid it down as 'the true principle of protection that such duties be imposed as will equal the difference between the cost of production at home and abroad.' And moreover, 'to establish maximum and minimum rates to be administered by the president under limitations fixed by the law, the maximum to be available to meet discriminations by foreign countries against American goods entering their market, and the minimum to represent the normal measure of protection at home; the aim and purpose of the Republican policy being not only to preserve, without excessive duties, that security against foreign competition to which American manufacturers, farmers and producers are entitled, but also to maintain the high standard of living of wage earners of this country, who are the most direct beneficiaries of the protective system.'"

Benjamin Briscoe Delves into Statistics To Prove His Side of the Argument Over Duty

Comparison of Wages

As indicating how close the foreign markets are to American trade, Mr. Briscoe pointed to the statement made by the representative of the importers when he appeared before the ways and means committee, in which he stated that even a 12 per cent reduction from the present tariff would be entirely satisfactory to the foreign makers. This statement was taken to imply that this small reduction was all that was needed to give the foreigners absolute control of the American motor car market. There can be no contradiction of the enormous difference in wages paid in this country. "Carefully compiled figures," said Mr. Broscoe, "show that 11,400 men in American factories, and 10,347 men in European factories, received an average yearly pay as follows:

	America	Europe
Workmen	$ 755.05	$306.00
Commercial employes	876.07	529.00
Technical employes	1,202.41	602.50

"This shows that the workmen in American factories are paid two and one-half times approximately what they get for the same work in the same kind of factories in Europe. Technical employes in the American factories receive approximately twice what they do in Europe, and commercial employes receive about one and three-fifths times what they are paid in Europe."

The following attended the meeting: H. B. Joy, Packard Motor Car Co.; A. L. Riker, Locomobile Co. of America; E. H. Parkhurst, Peerless Motor Car Co.; Benjamin Briscoe, Maxwell-Briscoe Motor Co.; Alfred Reeves, general manager A. M. C. M. A.; E. P. Chalfant, general manager A. L. A. M.

Brief by Bearings Makers

Washington, D. C., Dec. 12—Some very strong arguments why the duty on anti-friction ball-bearings should be increased have been presented to the ways and means committee, which is now holding meetings preparatory to revising the tariff, by the Excelsior Steel Ball Co., of Buffalo; Standard Roller Bearing Co., of Philadelphia, and the Timken Roller Bearing Axle Co., of Canton, O. The last-named put in an elaborate brief, from which the following excerpts are taken:

It is our understanding that paragraph 127, covering "anti-friction ball forgings," upon which a duty of "45 per cent ad valorem" is fixed, includes our product. There are at the present time a number of factories in this country devoted exclusively or to a large extent to the manufacture of anti-friction bearings, including ball and roller bearings, as well as the manufacture of steel balls. This industry is comparatively new, having been carried on to any extent only during the last 5 or 6 years. The early growth of this industry was very slow, but owing to the large number of motor cars manufactured within the past few years the business of manufacturing roller bearings has considerably increased. The foreign makers of roller bearings have been engaged in this business for a much longer time than American manufacturers, and but for the protection of this industry afforded by the Dingley bill this industry would not now be in existence, as it would not have been possible to compete with the foreign manufacturer.

By far the greater portion of the expense of manufacturing roller bearings is in the cost of the labor, a very small proportion of the entire cost being represented by the raw material going into this product. It is the labor put upon the raw material that almost entirely fixes the final cost of producing roller bearings. There is not a great difference in the price paid for the raw material by the foreign manufacturers from the cost of the same article to our manufacturers, there being a slight advantage in favor of the foreign maker.

The writer during the past summer of 1908 visited a number of plants in France, England, and other foreign countries where roller bearings, steel balls and various parts connected with anti-friction devices are manufactured and personally investigated the cost of the production of these articles in the foreign factories. It was at once apparent that the wide difference in the cost of production in favor of the foreign maker was owing to the fact that he paid his labor only a small per cent of the amount that our manufacturers pay for similar work in this country. In one factory employing about 2,000 hands the writer found skilled labor working on machines at an average price of $3.75 per week. On these same machines and for the same work we pay our employes an average of $15 per week.

Duty Should Be Increased

It can therefore be readily understood that the 45 per cent duty does not nearly compensate for the difference in the wages paid by the American manufacturer to his employes, considering the price of the same labor to the foreign manufacturer. To afford American workmen an opportunity to continue to earn fair wages in this industry there should be an increase rather than a reduction in the tariff. The American manufacturer of this product already feels keenly the competition arising from the importation into this country of similar foreign goods produced by underpaid labor.

The freight rates on this class of goods from Europe to points in this country are but a trifle in excess of the freight rates from the local manufacturers of anti-friction bearings to the users thereof; hence the foreign manufacturer is at little disadvantage in this respect. Our factory already has felt the effect of foreign competition to the

disadvantage of our workmen. About 2 months ago we were approached by one of the largest manufacturers of motor car parts in this country. For more than 2 years we have been supplying this concern with our roller bearings. This manufacturer advised us that it would be necessary to reduce the price of our bearings to meet lower figures at which roller bearings made in Germany were being offered. These roller bearings being well adapted to the use of the manufacturer, it was necessary for us to meet the price of the German maker or lose the entire business. In order to keep our men employed we thought it best to make a contract at the price fixed by the German maker, although in order to meet this price and not sustain a loss it was necessary for us to cut in a measure the wages of our workmen engaged in filling this order.

Argument on Bearings

We know from actual experience that if a reduction in the tariff on roller bearings is made the result will be the destruction of the industry in this country. We have invested about $1,000,000 in the business and have been giving constant employment to about 500 men. A large portion of our investment is represented by special machinery adapted to the peculiar needs of manufacturing roller bearings. This machinery is suitable for no other purpose, and if we are forced to abandon this industry by reason of the loss of adequate protection, the greater part of our investment will be an absolute loss and our force of workmen must seek other means of earning a livelihood.

Our roller bearings are used exclusively on motor cars. A motor car can be built without anti-friction bearings, but the purchaser of a motor car is usually a man who can afford to indulge in at least moderate luxuries, and therefore desires anti-friction bearings upon his machine, since they require less attention and have many advantages. A motor car is strictly a luxury—not a necessity in any sense of the word—since other much less expensive means of transportation have in the past and will in the future meet all the requirements of the great mass of the people. A reduction of the tariff upon roller bearings would not materially change the cost of motor cars. The foreign-made bearings answer the purpose, and if their price is lower, will be purchased in preference to American bearings by manufacturers having need of such supplies.

The maintenance of at least the present tariff upon roller bearings is not subject to the criticism that the price of an article in common use among the people is thereby maintained above what it should be. These bearings are purchased and used in connection with motor cars by those who can best afford to pay a fair price therefor. The vital question is not whether the manufacturer of roller bearings is permitted longer to carry on this industry so far as his personal advantage is concerned, but rather whether American labor shall be permitted to manufacture roller bearings used in our motor car works rather than by injudicious legislation surrender this new industry to our foreign competitors.

We earnestly insist that in place of a reduction of the tariff upon roller bearings there should be an increase in order that the return therefrom should be sufficient to afford fair remuneration to our workmen employed in this industry.

Broader Market Needed

Feeling the need of a broader market, we have recently concluded an arrangement to manufacture our roller bearings in England, as we had no hope of creating a foreign market for our goods made in this country, due solely to the fact that the existing rate of wages in this country is far in excess of that in England.

The cost of the raw material for our bearings in England is but little less than we pay here, however, owing to the fact that our cost of labor will be so much less in England than in this country we will be enabled from that point to compete with the foreign maker in his own legitimate territory. This situation demonstrates the fact that it is the price of labor that alone renders it impossible for the American manufacturer to compete with others engaged in a like industry in Europe. We believe that in order to safely maintain the wages that have been paid in the past to employes engaged in this industry there should be an increase of the tariff of at least 20 per cent.

The Standard Roller Bearing Co. also furnished the committee with a list of American motor car manufacturers who use foreign annular ball bearings, together with a list of importers of foreign ball bearings.

CHANGE IN RACE LAWS

International Association Decides To Permit Drivers To Do as They Please With Tires

Paris, Dec. 5—In next year's international races there will be full liberty to change tires in any way that appeals to the driver. He may pull them over a fixed rim in the old way, he may dismount the rim and tire together, or he may take off the entire wheel, in the manner dear to S. F. Edge, providing, of course, that the wheel bearing is not interfered with. The decision has just been arrived at by the International Association of Recognized Automoible Clubs, uniting France, Germany, America, England, Italy, Switzerland, Holland, Austria, Portugal and Belgium.

Resolutions were adopted which will make obligatory the use of Colonel Holden's electric timing machine in 1910. The machine, which has been in use at Brooklands track for several months, and is so sensitive that it will automatically register the passage of the front and rear wheels of a car traveling at 120 miles an hour, was brought before the international association at its last meeting and has since then been under observation in France. The decision was come to that where it is desired to have records recognized as international this machine must be used. It is impossible to put it into use everywhere for the coming season, and its adoption has been fixed for 1910.

Now that all details as to how, when and where the races shall be run, it only remains to be decided whether there shall be any races at all. The Automobile Club of France has a grand prix on its program for July, 1909; Italy has the intention of holding races at Bologna; Belgium is preparing for another Ardennes meet, and constructors all over Europe are signing an agreement not to race at all. It is somewhat ludicrous that while the racing board of the A. C. F., composed entirely of French constructors, and of those constructors who are most interested in racing, are settling such details as the number of bridges over the Anjou course or the height of the barricades, their own factories are signing a declaration against any races in 1909. From a mere group the movement has now spread to practically all the large European factories, those who have promised not to race in 1909, under a penalty of several thousand dollars, comprising Panhard, Renault, Brasier, Bayard-Clement, Darracq, Peugeot, Mercedes, Benz, Italia and Fiat. No mention of this boycott of racing was made at the international meeting, notwithstanding that hundreds of interested persons are asking what will be done next year, and motoring Europe is burning to know whether this is the end of the racing game. It is believed here by those opposing racing that the limit of speed has gone far beyond the point of sanity, and it is a question if the cost of high-speed racing is compensated for by the publicity secured and the spectacular though temporary interest enlisted from the public. There is no question whatever but that contests of various kinds, such as endurance tours, economy runs, and hill-climbs are still beneficial in various parts of the country, and that it would be a mistake to remove from the calendar all kinds of contests.

POOR MEET IN FRISCO

San Francisco, Cal., Dec. 7—A motor car race meet Sunday afternoon at the Tanforan track, just across the San Francisco county line, drew the largest crowd ever seen at any meet ever held in the state. Some estimates place the crowd as high as 10,000, and it is certain that this estimate is not very far wrong. The affair, however, was far from interesting, and now the officers of the Automobile Dealers' Association are busy explaining just how so poor an exhibition came to be given under its auspices. Interested in the affair were Barney Oldfield, Charles Soules and Hugh Hughes, the last named driving Christie's front driver. Lack of any real competition spoiled the meet, and the thousands of spectators left the track much disappointed. The blame has been put up to the local dealers, who failed to support the affair. As a consequence the president of the dealers' association has refused a sanction for another day's racing next Sunday, and the promoters have departed with about $4,000 of San Francisco's good gate money in their pockets.

Summaries:

Three-mile race for stripped stock cars, $4,000 or less—Donald Whalley, 30-horsepower White, won; G. Seyfried, 30-horsepower White, second; Frank Murray, Buick, third; time, 3:24.

Exhibition mile, flying start—Frank Fee, Comet; time, 1:05.

Exhibition mile, flying start—G. Seyfried, White; time, :59.

Exhibition mile, flying start—Barney Oldfield, Stearns; time, 1:03.

Five-mile free-for-all, final heat—Barney Oldfield, Stearns, won; Charles Soules, Stearns, second; time, 5:21.

Three-mile race for fully equipped touring cars—G. H. Seeley, Peerless, won; time, 4:22. George Hoff, Packard, did not finish.

Five-mile free-for-all handicap—E. P. Cooper, Comet, 40 seconds handicap, won. Also competed: Frank Fee, Comet; Frank Murray, Buick; Charles Soules, Stearns.

AFTER MEMORIAL HIGHWAY

Washington, D. C., Dec. 12—The present session of congress was signalized by the introduction of several bills for the construction of a memorial highway from the White House, in this city, to the battlefield of Gettysburg, as a national tribute of affection toward Abraham Lincoln. It is provided that this highway is to be not less than 150 feet wide, and in its construction the sum of $3,000,000 is to be utilized. The proposed memorial highway is to be constructed under the direction of a commission composed of the chairman and the ranking Democratic member of the senate and house library committees of the present congress, the secretary of state and the secretary of war.

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Ignition Well Cared For

NEXT year gives promise of being a great ignition season. Cars selling at less than $1,000 will be fitted with magnetos by many of the leading makers and cars at $1,750 and up will almost invariably be equipped with some form or another of this device. This season scores of makes of medium-priced machines were regularly listed without magnetos, but not so for 1909. The majority of makers have decided to equip with a good one and if necessary raise the price a little in order to make this possible. Practically all of the makers now have the crankcases of their motors fitted with an integral bed piece on which the magneto can be attached and where a magneto is not regularly fitted this bed piece is often on hand, where it is ready in case the buyer decides to add one.

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THE magneto is far, however, from being the czar of the ignition field; it has many and varied rivals, one of the greatest, besides the storage battery or dry cell, being special devices which incorporate a coil, a primary make-and-break and a distributer. Some of these are carried on the dash and others on the top of a vertical shaft, the same as a timer or distributer. So great has been the energy displayed by one of these devices that, the coil, timer and distributer have been placed in a comparatively small cylindrical case, not much larger than a distributer case.

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ONE most notable advantage of the magneto and one of these special devices is the great reduction in the amount of wire needed. With high-tension magnetos all that is necessary is from the magneto to the four plugs and to the switch. In not a few special systems the same amount will suffice, and with the new magnetic low-tension igniter plugs no more is needed. This abbreviation of wiring is a great boon to motorists because of the simplicity attained and the reduction of danger of short circuiting due to breaking down of the insulation.

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AS to which type of magneto will attain the supremacy there is as much diversity as a year ago—perhaps a little more. Several of the builders of high-priced machines fit only the high-tension type which has a primary and secondary winding on the armature; others prefer the low-tension make in which the current is stepped up in voltage by a non-vibrator coil carried on the car dash. Still others pin all faith to the new inductor type which is making its appearance strong in the 1909 field. This magneto has soft iron inductor wings on the revolving shaft instead of a winding and the only winding is a coarse wire or ribbon coil in a plane between the inductor wings. Some makers of these magnetos incorporate a make-and-break device for the secondary, using a separate coil, but containing the high-tension distributer; while others only generate a low-tension alternating current, and so simply take the place of the storage or dry cell. Lastly comes the generator as a current producer. The battle of spark plugs rages as furiously; in the vibrator-coil field the attainment of high vibrator speed because of increased crankshaft speed is proving one of the big factors.

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JUDGING from the reports from the Paris salon, low-tension with make-and-break parts is rapidly falling into disuse, the Italians and one or two German makers being the only exponents of it. With the magneto and spark plugs better timing is obtainable and a simpler motor construction is possible. In America the exact status of the low-tension ignition will be gauged when the show circuit opens, and it is anticipated that it will be practically where it is this year.

America and International Rules

INTERNATIONAL rules adopted by the International Association of Recognized Automobile clubs at Ostend July 14, 1907, declared that racing cars for 1908 should have a cylinder diameter of 6.1 inches for four-cylinder cars, and proportionate diameters for one, two, three, six and eight-cylinder types. These rules dictated further. This same International Association of Recognized Automobile clubs has again declared from its European stronghold that for 1909 the cylinders shall have a diameter of not more than 5.1 inches on four-cylinder cars and proportionate diameters for one, three, six and eight-cylinder machines. It is not the purpose in these pages to say whether or not 5.1 is the most suitable diameter for racing car cylinders for next year, but it is the purpose to see what voice American makers have in determining the cylinder sizes and to discover whether or not America, the greatest motor-car producing country in the world, numerically, has voted a united representative American vote on the adoption of the 1909 rules.

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THE Anglo-Saxon race has been the parent of responsible government, it originated and safely guarded; the privileges of petitioning and been a bulwark at all times for democratic principles and parliamentary right, and does it not appear most unnatural that the twenty-five or thirty American car builders who have followed road racing in this country for 4 or 5 years should not vote a united vote when the international rules governing racing are being adopted, whether these rules are adopted at Ostend, at Paris, Berlin or London? In the past the American maker has not been a factor in determining the governing rules, and now he has to accept the dictation of Europe on the 1909 rules without even the futile opportunity of registering his vote against them.

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THIS is not Americanism; this is not the spirit that conquered in 1776; again carried itself to victory in 1862, and later defied Spain in Cuba and the Philippines. This spirit of acceptance without even a voice in discussion is not the one that wrung the Magna Charta from despotism in 1216 and later gave birth to a nation in the Declaration of Independence; neither is this the spirit of the individual American car maker. Why, then, have American makers not voiced themselves in this international conclave as have France, Germany, Italy and Belgium? It is true American makers have not. Before the 1909 rules were adopted French makers met in numerous conventions at which the minutest details of the rules were gone over, and France, as a united France, appeared at the international congress prepared to fight for the rules that its many makers had agreed were best suited to the needs of those makers.

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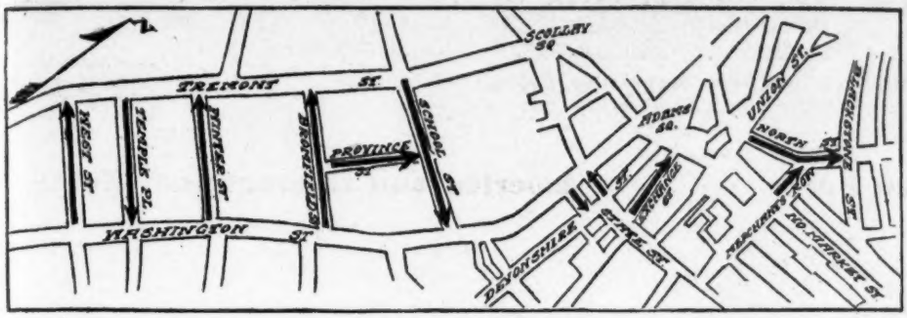
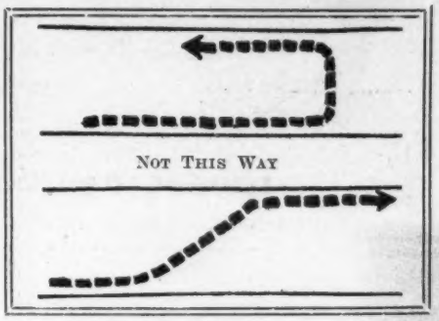
GERMANS fight for motor features best suited to the Fatherland conditions; French contend for sizes most advantageous to their domain; so do Italy, Belgium, England and Switzerland. Then why not also America? French makers are today booming the long-stroke, single-cylinder engine, because it is economical on gasoline or essence, which has a fabulous price in France. The long stroke makes imperative a low clearance, which is very possible with France and continental roads, but most impossible on American roads. The long-stroke engine will not appeal to American makers, if gasoline consumption is the prime consideration, because, owing to its low price, it is an almost negligible quantity as compared with it in France.

HUB TO TRY NEW WAY OF HANDLING TRAFFIC



BOSTON'S TEN ONE-WAY STREETS



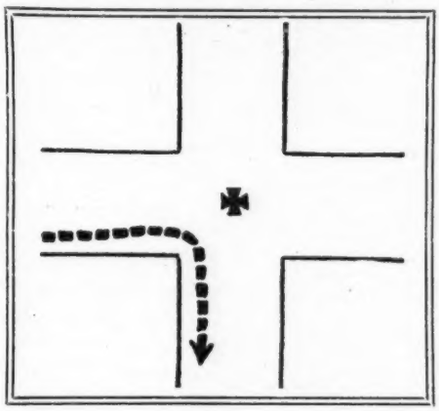
SECTION 7

BOSTON, Mass., Dec. 15—Beginning January 1, 1909, there will go into effect in Boston a set of rules and regulations regarding traffic that has been worked out by the street commissioners after months of study. The penalty for each violation is $20. Naturally motor vehicles are effected as well as horse-drawn ones. Boston has such narrow streets that the congestion at times has been so bad that it took a long time to make a trip of a mile down town. A newly formed traffic squad will enforce the new laws. Under the new regulations vehicles must keep off certain streets altogether unless they are going in one general direction. This will mean of course going a block or two sometimes to complete a journey.

Shopping District Effected

The shopping district is down town principally between Tremont and Washington streets, including part of those two streets, any many women use their motor cars to make the trip. Now when they get out of the car they will not find it waiting for them when they return. Instead it will be in a line across the street on Tremont street, while for Washington and other side streets, the owner must make an appointment for some specific time to get in again, meanwhile the driver must move on somewhere.

The rule that slow-moving vehicles must keep near the right-hand curb will allow the motor cars a chance to swing along if the road is clear 100 feet ahead and this will facilitate matters much. The drivers of motor cars must blow their horns at all crossings and intersecting streets now. Pedestrians are also given some suggestions that they use some care in crossing the street, and before stepping off the sidewalk to look about them. On some of the streets no team or motor car is allowed to turn around if it must back up to do so, therefore the small car will have an advantage over the large one for the streets are so narrow there are very few where this may be done. No motor vehicle longer than 26 feet may be operated except under special permit. No one must stop abreast of another vehicle except in an emergency. And the nuisance of small boys riding on the baggage racks of motor cars will be stopped as this comes under the penalty clause.



SECTION 5

Youngsters Refused Licenses

The regulations also state that no one under 16 may drive a public vehicle, this being on the same policy of the state highway commission which refuses to license any chauffeur under that age. The speed is limited to 8 miles an hour around curves, corners or crossing intersecting streets, but it is provided that this is not necessarily the speed that may be used under all conditions, it being qualified by the phrase "that no vehicle may be driven with a reckless or negligent disregard for the conditions of travel and the rights of others."

The most important regulations as affecting motor cars are those relating to vehicles in motion. They are as follows:

Article 1—Vehicles in motion.

Sec. 1—A vehicle, except when passing a vehicle ahead, shall keep to the right and as near the right curb as possible.

Sec. 2—A vehicle meeting another vehicle shall pass on the right.

Sec. 3—A vehicle overtaking another vehicle shall, in passing, keep to the left, but it shall not leave the line on the right unless there is a clear way of at least 100 feet in advance on the left.

Sec. 4—On a highway divided longitudinally by a parkway, viaduct, walk, sunken way or subway structure, vehicles shall keep to the right of such division.

Sec. 5—A vehicle in turning to the right into another street shall keep as near to the right curb as possible.

Sec. 6—A vehicle turning to the left into another street shall pass to the right of and beyond the center of the intersecting street before turning.

Sec. 7—A vehicle crossing from one side of the street to the other shall do so by turning to the left, so as to head in the general direction of traffic on that side of the street.

Sec. 8—Slow-moving vehicles shall keep as closely as possible to the curb on the right, so as to allow faster moving vehicles free passage on the left.

Sec. 9—No person having charge of a vehicle shall allow the same to come within 10 feet of any vehicle in front of him when approaching and passing over a crossing where a pedestrian is about to pass.

Sec. 10—No person shall drive, guide or have the care of two or more horses harnessed respectively to different vehicles.

Article 2—Signals of vehicles, police and other signals.

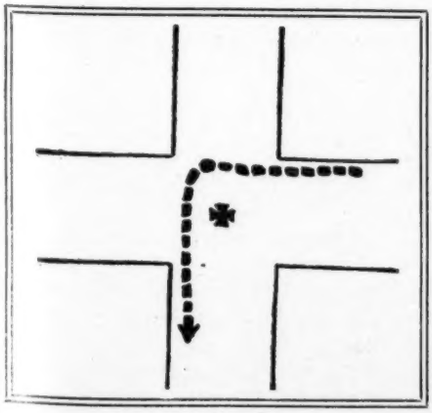
Sec. 1—Every driver of a vehicle shall, in slowing up or stopping, give a signal to those behind by raising a whip or hand vertically.

Sec. 2—In turning while in motion or in starting to turn from a standstill a signal shall be given by the driver of the vehicle about to be turned by raising a whip or hand, indicating the direction in which the turn is to be made.

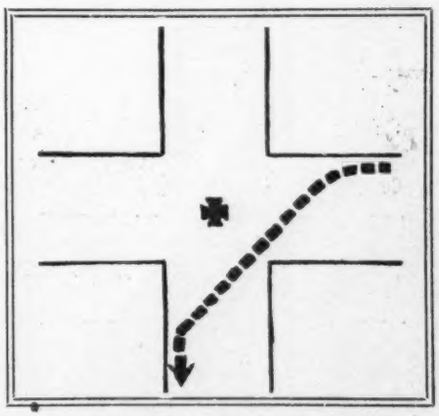
Sec. 3—Before backing ample warning shall be given by voice or uplifted hand, and while backing unceasing vigilance must be exercised by the driver not to injure those behind.

Sec. 4—Drivers of motor vehicles of all kinds shall, in approaching a crossing or in rounding a corner or curve of a public street, sound their signals in such a way as to give warning to other vehicles and to pedestrians of their approach.

Sec. 5—Vehicles must stop so as not to interfere with or prevent the passage of pedestrians at crossings, and at all times drivers of vehicles must stop the same on a signal from a police officer.



SECTION 6—RIGHT WAY



SECTION 6—WRONG WAY

CARRIS ONLY PERFECT SCORE AT WORCESTER

FRANKLIN, DRIVEN BY CARRIS, ONLY PERFECT SCORE CAR IN WORCESTER RUN

WORCESTER, MASS., Dec. 15—C. S. Carris, driving a Franklin air-cooler, was the only one to make a perfect score in the winter reliability run of the Worcester Automobile Club, held Saturday, and in which competed fourteen cars and which attracted some of the best drivers in the country—Carris, McNamara in the Premier, Cobe in the Lozier and Dension and Bourque, the Knox pair. This made the fifth perfect score for Carris this year. He went clean in the Glidden; he was one of the three who survived the run-off of the tie in the Boston 24-hour endurance run; he was one of five perfect in the Chicago Motor Club's 1,000-mile reliability and he was letter perfect in the Cleveland test.

The run last Saturday was over a 210-mile route and the trip was made through the snow. Eight of the cars made perfect road scores but seven of the eight were eliminated by the examination of the technical committee. Those with perfect road scores were the McNamara Premier, the Llyod American roadster, the Cobe Lozier, the Robinson Rambler, the Wilson Lozier, the Denison Knox and the Murch Cadillac

Technical Committee's Report

The technical committee was unable to find anything wrong with the Franklin. The Rambler driven by Robinson was penalized 2 points, one for a loose petcock on the pump and the other for a loose pin on the spark control. The Cadillac got a point for a loose terminal on the dash, and another for a loose bolt on the rear end tie rod between the radiator and the dash, a total of 2. The American's 5 points were: Bolt gone on engine pan, 1; loose nut on throttle bolt, 1; loose bolt in hood frame, 1; loose stuffing box on pump, 1; loose cup on steering knuckle, 1. The examination gave the Denison Knox 6 points as follows: Loose nut on engine pan, 1; loose spring clips, 2; loose spring nuts, 2; loose adjusting collar on steering post, 1. Cobe in the Lozier drew 7 demerits—loose screw in the floor plate of the steering wheel, 1; loose nuts in ignition coil, 3; lost nut in ignition coil, 1; loose control head,1; loose hose connection, 1.

On the Berkshire the penalties were as follows: Loose radiator, 4; bolt lost from crankcase cover, 1; bolt loose on crankcase cover, 3; loose spring clips, 3; loose spring bolts, 2; packing gone from exhaust, 1; loose bolt on exhaust, 1; labor of three men for 2 minutes, 12; total 25. The Studebaker: Loose left mud guard, 2; left spring link upside down, 5; two loose bolts in left running board brace, 2; three engine frame bolts loose, 3; loose pan, 1; loose steering gear joint, 7½; three spokes in rear wheel broken, 15; motor stopped 5 minutes, 10; 8½ minutes late at control, 9; total, 54½. Wilson Lozier: Ten spokes broken in left rear wheel, 50; loose nut on right spring clip, 1; three loose oil connections, 3; three loose nuts on coil box, 3; loose spring clip on rear spring, 1; loose terminal on magneto, 1; two loose spring clips, 2; loose left front bearing, 1; total, 62. Premier: Loose nut on steering knuckle, 16; loose spring clip, 1; loose dash bolt, 1; small leak in radiator, 5; total, 22.

Cars Garaged Over Sunday

The examination was conducted at the Pilot garage on Sunday. The cars had been in charge of a deputy sheriff over night. On Sunday the committee worked practically the entire day in completing its work. The examination was one of the most thorough ever given cars in any contest in this country, the committee being members of the staff of professors at the noted Worcester

RESULTS OF WINTER RELIABILITY RUN OF WORCESTER CLUB

Name of car	H.P.	Cyl. bore	Piston stroke	Car model	Driver	Penalty
Premier	30	4⅛	4½	30	Ray McNamara	22
American	50	5⅜	5½	Toy tonneau	D. F. Lloyd	5
Lozier	45	5¼	5¼	H	H. H. Cobe	7
Franklin	28	4¼	4	D	C. S. Carris	0
Rambler	34	4½	4½	44	Birney A. Robinson	2
Lozier	50	4⅝	5½	I	H. E. Wilson	62
Knox touring car.	38	4⅞	4¾	O	A. E. Denison	6
Cadillac	30	4	4½	30	H. J. Murch	2
Studebaker	30	4⅛	5¼	H	Jack Oswald	54½
Jackson	30	4½	4½	H	E. P. Blake	Out
Knox	38	4⅞	4¾	O	William Bourque	Out
Rambler	34	4½	4½	44	E. W. Williams	Out
Berkshire	35	4 11-16	5½	D	E. P. Belcher	25
White	30	3.6	4½	K	George Stowe	Out

ONE OF THE LOZIERS CHECKING IN AT WORCESTER

Polytechnic institute. That eight cars, more than half the starters, should have gone through with perfect scores, speaks volumes in itself for motor car construction.

The six cars which failed to finish with perfect road scores suffered from accidents in the main, and from other slight things which did not affect their structural features. For instance, the Studebaker car was penalized for being late at one of the controls simply because its operators had neglected to take the precaution to fill up their gasoline tank. The Berkshire operator forgot himself for a moment, when arriving at the city control upon the completion of the first run and shut off his engine, thereby causing a penalty. E. P. Blake in the Jackson smashed an axle owing to the slippery conditions of the road which caused his car to skid and make three complete revolutions, finally butting up against a wood pile and throwing out the four occupants, none of whom was injured.

Bourque Comes to Grief

Bourque in the same Knox sportabout he drove in the Vanderbilt race came to grief in Tatnuck. The American car ahead of him traveling at a great rate of speed began to skid and Bourque, following closely behind was in imminent danger of colliding. He had to drive into a ditch which broke the valve stem on his car. He withdrew rather than stand for 60 points penalization that making the repair would entail.

Denison, also driving a Knox, had a close call on the fifth round. There was no way of seeing whether or not a train was coming in either direction at a grade crossing in Colebrook and there was no flagman on the crossing. He was speeding along with three passengers and covered the crossing just a fraction of a second ahead of a fast express which whizzed into sight and over the crossing. Williams in the Rambler was unfortunate enough to have a key on one of the rear wheels shear off between Princeton and Quinapoxet and leave him helpless 6 miles from a telephone. He retired from the contest.

The White steamer, which had traveled some 20,000 this last season and which up to the last control of the day had been performing exceptionally well, met with slight difficulties and was penalized accordingly. The only other car to have double penalties was the Berkshire which had to be pushed up a hill by the passengers on the last control of the day.

Start Out in Snow

The contest started at 6 o'clock in the morning in a rain and snow storm which continued until noon. Then the sun came out and the afternoon runs were truly enjoyable. The contest finished in darkness about 6 o'clock. The contest was split up into five runs each about 20 miles out and 20 miles in. The snow of the day before made the going particularly hard out in the country. The starting and ending point for each control was in Worcester.

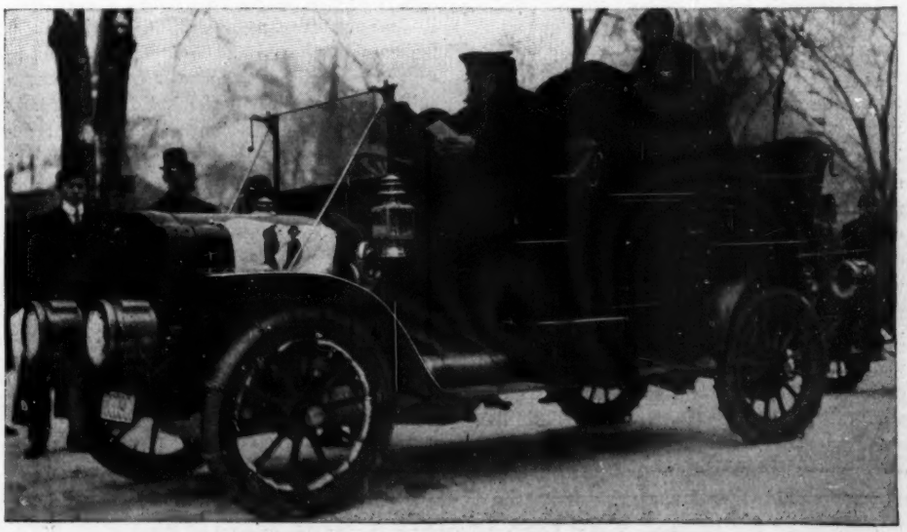
The rules called for some pretty severe work and these rules were all carried out with the exception of the brake clutch and transmission tests. At the close of the tests all the contestants voted upon the advisibility of holding these tests. The only one objector to their abandonment was Henry Johnson of the Premier and he withdrew when he found he was the only one.

Cobe started out on the first control to show what speed his Lozier had and the others started in to follow suit. This quickly resulted in Police Chief D. A. Matthews sending a sergeant to notify President Coghlin that should the speed law be violated after the second control all drivers would be arrested and taken out of the contest. There were no arrests, the contestants slowing down while within the confines of the city.

PREMIER RUNNING OVER SNOWY ROAD NEAR MILLBURY, MASS.

DINNER RESULTS FATALLY

New York, Dec. 14—John B. Rowland, of the J. B. Rowland advertising agency succumbed to typhoid fever on Saturday last, and the news of his death brought to light the fact that he was but one of a quintet of sufferers who contracted the fever at the same time as the result of partaking of raw oysters at a dinner party held at a New York hotel the day following election. The others were A. B. Elliott, vice-president of the Witherbee Igniter Co., who died Thanksgiving day, Herbert Lytle, the well-known racing driver, Louis A. Hopkins, formerly sales manager for the American Mors, and Thomas G. Wetzel, the latter three of whom are still suffering with the fever. Mr. Rowland was the first to be stricken, but his case was not considered very serious and up to within a few days of his death, it was thought that he stood a fair chance of recovery. He was born in Washington, D. C., 31 years ago, and was a graduate of Georgetown university. About 3 years ago he entered the advertising business in this city and made a success of it from the start, having quite a number of motor accessory accounts. He leaves a widow. Mr. Elliott did not show any ill effects of his experience until a fortnight after Mr. Rowland had been taken sick, but his case was considered dangerous from the very outset and his death after a very short period of suffering did not come as a surprise to his physicians and family. Of the remaining three, Lytle is still in a hospital at Toledo, Hopkins is confined to his home in New York, and Wetzel is in a sanitarium in the same city.



WHITE STEAMER, ONE OF THE CONTESTANTS AT WORCESTER

UNCLE SAM'S ROAD EXPERT MAKES HIS REPORT

Approximately America Has 43,450 Miles of Macadam, and 124,468 Miles of Gravel

WASHINGTON, D. C., Dec. 14—No class of people in this country are more interested in the subject of good roads than the motorists, and to them that portion of the annual report of the secretary of agriculture, submitted to President Roosevelt today dealing with this important question, is of particular interest. Secretary Wilson says that the department, while endeavoring by practical demonstration and scientific experiment to improve methods of construction and maintenance, has lost no opportunity of awakening the public to a proper appreciation of the great economic importance of road improvement and the necessity for reform in the management of the public roads.

America Has Miles of Roads

Some conception may be had of the immensity of the task by considering the fact that there are 2,151,000 miles of roads in the United States, a sufficient length to encircle the globe at the equator with eighty-six parallel roads. The total expenditure upon the roads for 1904 was nearly $80,000,000. At that time about 38,600 miles had been surfaced with stone, 108,200 with gravel, and 6,800 with special materials, making the whole mileage of improved roads only 7.14 per cent of the total. An effort has been made by the engineers of the department to estimate the mileage of improved roads in 1908. Taking the 1904 figures as a basis, and assuming that the macadam roads have increased 12.5 per cent, the gravel 15 per cent, and those surfaced with special materials 25 per cent, we have 43,450 miles of macadam, 124,468 of gravel, and 8,512 surfaced with special materials. The cost of the macadam has been estimated at $4,500 per mile, of the gravel at $1,500, and of the other surfacing materials at $1,000. There is about 1,975,000 miles of earth road, which it is estimated has cost for grading, culverts, bridges and all other items of expense an average of $500 per mile.

Effect of Motor Traffic

The destructive effects of motor car traffic on macadam roads have occasioned much uneasiness, as many million dollars have been expended in this form of construction. The engineers of the department have, in common with others in this country and in France and England, conducted numerous experiments with a view to determining the exact cause of the deterioration of macadam roads and of devising methods of treatment or construction which would effectually meet existing conditions. The materials used in the experiments by the department have included, among others, tar preparations, asphalt oils, temporary expedients, such as calcium chloride, and several special preparations originated by the office of public roads of the department. Some measure of success has attended the work thus far, and it is hoped that much progress will be made within the next few years.

So important has the subject of road improvement become that an international road congress has just concluded its deliberations at Paris, France, which was participated in by the representatives of twenty-nine governments, and at which nearly 100 valuable papers on various phases of the subject were presented. The most important outcome of this congress was the formation of an international bureau of roads, to be composed of two or more delegates from each of the governments represented at the congress. The purpose of this bureau is to collect and make available for all of its members all data of importance on the subject of roads in every country. It is gratifying to be able to state that the suggestion for such a bureau was made by the chairman of the commission representing the United States, and that it was unanimously adopted by the congress.

Testing Road Material

The testing of road materials to determine their suitability for road building has reached a high state of efficiency in the department and it is a cause for much gratification that the work which is being done by the road-material laboratory is regarded in England, and by many authorities in other European countries, as being further advanced and more effective than similar work done in any other government laboratory in the world.

Approximately 20,000,000 tons of blast-slag are produced annually in the United States, most of which is a total waste. Slag has been used very slightly as a road-building material, for the reason that it is exceedingly difficult to maintain a well-bonded surface. The office of public roads has, during the past year, inaugurated experiments in the building of roads of slag in combination with tar and asphalt preparations along original lines. It is hoped that these experiments will not only open the way for a more general use of slag as a road material, but that the addition of bituminous binders will result in much progress in the development of dustless roads.

CARRIAGE DEALERS INVITED

New York, Dec. 14—The show committee of the American Motor Car Manufacturers' Association has decided to extend the courtesies of the Grand Central palace exhibition next month to 2,200 carriage dealers who have a rating of $50,000 or more. This action is taken because of the great interest manifested in the motor car trade by hundreds of carriage dealers throughout the country who are taking up motor cars. Their well-equipped salesrooms and wide acquaintance with the buying public make them excellent motor car agents, it is contended, and for that reason they will have the run of the show in the palace. That the trade is not alone in its desire to see the 1909 models, is shown by the interest displayed by society, the army and engineers engaged in other mechanical lines, and for their benefit, special nights have been set apart so that they can study the cars at their leisure. Military night has been set for Friday, January 1, when the leading United States army officers from Governor's Island, Fort Schuyler, Fort Wadsworth and Fort Hamilton will attend in a body. Many of them saw what an ordinary touring car could do in the way of courier and dispatch work at the Fort Plain maneuvers last summer and the majority of army officers would like to see the motor car and tractor trains employed by the American army the same as has been successfully done abroad for some years past. Engineers' night has been set for January 4, and invitations have been extended not only to the engineers connected with the American Motor Car Manufacturers' Association, the licensed association and the National Association of Automobile Manufacturers, but to the members of the Engineers' Club, the American Institute of Electrical Engineers, the American Society of Mechanical Engineers and the Society of Automobile Engineers. Fred W. Bent's orchestra will furnish the music and Bent has composed several airs for the occasion, which will include a tuneful march called the "International;" a lively two-step entitled "Around the Jericho Turnpike;" a rattling gallop named the "Last Lap," and a waltz appropriately christened the "1909 Model." It will be noticed that these are motoring pieces.

OUTLOOK IN NOVA SCOTIA

Washington, D. C., Dec. 12—Relative to the outlook for the increased use of motor cars in Nova Scotia, the federal trade promotion bureau is advised that if manufacturers would follow the same methods in introducing and pushing the sale of their machines in Halifax and other Nova Scotian cities as they do in the home market, the results would be much greater than they are. Motor cars have not been in much favor in the past on account of the poor condition of the roads throughout the province, but there has been a decided effort made to overcome this defect. At the last session of the legislature a bill was passed authorizing the establishment of a department of roads, and appropriating $175,000 for the improvement of the

roads and $25,000 for the erection of small bridges.

There are ninety-seven motor cars registered at the office of the provincial secretary, divided as to origin as follows: United States, sixty-one; Canada, thirty-two; England, three; Scotland, one. According to the population and wealth of Nova Scotia, this is a poor showing, and is largely due to defective methods used in introducing motor cars. The Canadian makes are built on the same lines as those made in the United States, most of them being manufactured by American firms having factories in Canada. The predominating style is the runabout and the lighter touring cars, from 8 to 30 horsepower.

While improved roads will do much to increase the sale of motor cars, the last legislature passed another law which will have a tendency to interfere somewhat with the general use of motor cars in some localities. This law gave to each local government the right to regulate the running of cars in their respective jurisdictions. Of the twenty-four municipalities —or districts—thirty-four towns and two cities in the province, four municipalities and two towns have regulated the running of motor cars and prohibited them on certain days.

Medium and low-priced cars are mostly in use, and there is no question but what a larger business could be done if the market were properly looked after. The province of Nova Scotia has a population of about 500,000, and the city of Halifax 50,000, the wealth of the people comparing favorably with similar districts in the United States. The duty on motor cars from the United States is 35 per cent ad valorem; from Great Britain a duty of 22½ per cent is charged. Shipments from the United States should be accompanied by a certified invoice; the forms required by the Canadian customs can be obtained from the nearest British consular officer, or United States customs brokers, as a rule, and any information in connection with the same.

BADGERS AFTER A HOME

Milwaukee, Wis., Dec. 14—Members of the Milwaukee Automobile Club, having safely passed through the crisis of the annual election, are taking hold of the clubhouse project in energetic style. Unless there is an unexpected hitch, construction work will be started early next spring on a $10,000 home. A stock company will be formed among the members to purchase a site of 3 or 4 acres and provide funds for the erection of the clubhouse. The site tentatively chosen is on the famous Whitefish bay road, a favorite haunt for owners. It is the best piece of highway in Wisconsin, and being owned by a private corporation, is kept in fine condition all the year round. The site is ideal and will give the club one of the best locations in Milwaukee.

RUN IS MADE HARDER

Quaker City Motor Club Picks Strenuous Course For Its January Reliability Run

Philadelphia, Pa., Dec. 14—With the 2-days' New Year endurance run of the Quaker City Motor Club still over 2 weeks off, there are already seventeen entries—fourteen class A, for touring cars, and three class B, for roadsters and runabouts. The contest committee has assurances of at least thirty starters. Had the committee listened to the pleas of many prospective entrants —dealers as well as private owners—an easy route would have been selected, and an entry list aggregating at least sixty assured. But it was determined, after last year's by no means easy run, when there were several clean-scores, which necessitated a number of run-offs, to make this year's run an endurance run in all that the term implies. Over the mountains to Wilkes-Barre is not a joy ride, even under the best of conditions; but in the middle of winter, with frozen, rutty mountain roads and possible heavy snow storms, the 153.8-mile outward trip via Allentown and Stroudsburg, and the 146-mile homeward journey by way of Hazelton, Reading and Pottstown, will prove such a test as will eliminate all but the best-built cars and try the staying powers of drivers and passengers to the limit.

Following the Delaware from Easton to the water gap—well-known country to all the contestants—the route for the first day plunges directly into the mountain region at Stroudsburg, from which place the 50 miles to Wilkes-Barre, the overnight stop, will furnish a bewildering succession of steep up and down going, sharp turns and narrow roads for which that summer pleasure country is famous, but which in winter will test the nerve and ability of even the headiest drivers. Going into Wilkes-Barre the run will have to coast down Giant's Despair. "Low gear and keep your eyes open," says the schedule.

The second day's route reverses the celebrated march of the king of France—for the route leads up Giant's Despair and on over the mountains through White Haven and Freeland to Hazelton, and thence over the backbone, separating the Susquehanna and Delaware valleys to Hamburg, Reading and home—heart-breaking going, three-fifths of it. Recognizing the difficulties of the route, the donors of the big $600 cup, MacDonald & Campbell, have announced that the winner in class A will be given permanent possession of that emblem, which has been won once each by the Stevens-Duryea and the White. The class B cup will be hung up by the club, and will also go "for keeps" to the winner.

The Motor Club of Harrisburg, which conducted very successful reliability contests in 1907 and 1908, announces a 4-day reliability run for the first week in May, 1909. As it is generally understood that next year's Glidden tour will start from Chicago and proceed westward, the Harrisburg club will aim to make its contest the important eastern reliability tour of 1909. The route for the tour has not been determined upon but New York and Philadelphia will likely be two of the night stops and many important eastern cities will be included in the course of the run. The rules will provide for a schedule well up to the legal limit, with a number of checking stations on each day's run and observers on all cars, and a technical examination at the finish. One of the features will be an actual tire record giving a practical contest for tire manufacturers.

POPE COMPANY REORGANIZED

Hartford, Conn., Dec. 12—The reorganization of the Pope Mfg. Co. was practically completed this morning, a meeting of the stockholders having been held at the office of the company in this city. The new company is incorporated under the laws of the state of Connecticut and within a few days will acquire the property of the old organization. The Pope-Hartford motor car and Columbia and kindred bicycles will be manufactured.

In about 10 days the receivers of the old company will pay the fourth dividend on the approved claims as well as interest of 6 per cent on all debts covered by the four dividends. The incorporators of the new company are Albert L. Pope, Colonel George Pope, Charles E. Walker and Wilbur C. Walker. The amount of capital stock named in the incorporation papers is $2,500,000 of preferred stock and $4,000,000 of common stock shares at $100 each, of which thirty shares have been subscribed for the purposes of incorporation. It is stated on good authority that the full amount of stock is practically taken.

The stockholders at this morning's meeting were the four incorporators and Lewis H. Freedman, of the law firm of Joline, Larkin & Rathbone, of New York, who, besides himself, represented Harry Bonner, August Heckscher, Frederick H. Ecker, Albert Stickney, Henry V. Poor, Arthur W. Pope, Milton Ferguson. Albert L. Pope presided. A draft of the proposed by-laws of the company was presented and adopted after which directors were elected as follows: For 1 year—Harry Bronner, Frederick H. Ecker and August Heckscher. For 2 years—Lewis H. Freedman, Albert Stickney and A. W. Pope. For 3 years—Henry V. Poor, A. L. Pope and Milton Ferguson. A meeting of the directors will be held in New York next week when the officers will be elected. The receivers of the company have gradually sold off such of the plants and property as were not necessarily needed to successfully carry on the company's business.

The Readers' Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems and invites a discussion of pertinent subjects. Correspondence is solicited from subscribers and others.

DIFFERENCE IN AXLE TYPES

Washington, D. C.—Editor Motor Age—Will Motor Age, through the Readers' Clearing House, explain the difference between a semi-floating axle and a full floating one, the good points in one over the other, if any, and which is considers the best construction?—R. L. Corby.

In a full floating axle the entire weight of the car is carried on the axle housing, and the driveshafts only rotate the wheels. In this axle the driveshafts may be withdrawn by removing the hub caps, this withdrawal being possible because the inner ends of the shafts are a squared fit in the differential gears. In a semi-floating axle the entire car weight is carried on the axle housing and the axle driveshafts simply rotate the wheels, but these shafts cannot be withdrawn endwise by removing the hub cap. The reason of this is that one or two makers form the differential bevels integrally with the inner ends of the driveshafts, the reason for this not being very plain in several cases.

CARE OF CAR IN WINTER

Tarrytown, N. Y.—Editor Motor Age—Although many motorists prefer to keep their car in commission during the entire winter, the man who cares for his own car should remove the tires from the rims and find a place for them where they will not be subjected to extremes in temperature. The insides of the rims should be cleaned thoroughly and a coat of air-dry enamel applied to the inner surfaces, where the tire comes in contact with the rim, to prevent rust. There are various preparations used to preserve bright brass surfaces, such as radiators, lamps, levers, etc., but the cheapest is common slab oil. If this cannot be procured, 3-in-1 oil will be found to give excellent protection, as I have discovered.—Benjamin Briscoe.

ON MERITS OF STEAM CARS

St. Louis, Mo.—Editor Motor Age—Will Motor Age give me some information relative to the White steamers? How do they compare with a gas motor for touring, and do they stand up better for country work? What is Motor Age's idea as to the regulation of heat from the front seat of the car? What car holds the world's circular track record for the mile?—M. M.

Steam cars are on a par with gasoline machines for touring and regular country use, and judging from many tests they stand up equally well. The heat in White steamers is regulated by automatic means, the driver only having to look after opening and closing of the throttle. The flow of water to the generator is also automatically controlled, being taken entirely out of the driver's care. The temperature of the steam is shown by a gauge on the footboard, and on the steam pressure dial a red pointer shows when the fire comes on in response to the automatic control devices. The mile record on a circular track was made by de Palma in a 90-horsepower Fiat at Minneapolis and is :51.

ON THE USE OF SOAPS

Chicago, Ill.—Editor Motor Age—I was particularly interested in a communication November 12, page 19, headed "How to Use Soap," and have a few experiences and a little information which may be useful to motor car users. There are a great many kinds of soaps on the market, some of which are made from linseed oil, others from cottonseed oil, and some from corn oil, but in my experience the best are those made from linseed oil. In using a linseed oil soap dissolve it in warm water, which prevents the evaporation of any of the soap. After washing with the soap, the body should be rinsed with clear water and polished with a dry cloth. Chamois is the best for polishing purposes. It frequently happens with the majority of soaps that it is best to keep them in solution ready for use.—Reader.

CASTOR OIL LUBRICATION

Jersey City, N. J.—Editor Motor Age—Under the heading "Some Prophesies of 1909 Racing Cars," by Rene M. Petard, in one of the recent numbers of Motor Age, there appeared a statement that "castor oil lubrication inaugurated this year will certainly generalize next season as favoring the enormous piston speed aimed at." Castor oil is a vegetable oil having both a high viscosity and specific gravity, and contains free fatty acids running from 0.7 per cent to 14 per cent. Brannt says: "By long exposure to the air it becomes thick and forms a viscous mass, and even acquires poisonous qualities." We fail to see why a pure vegetable oil of high viscosity is recommended for the lubrication of internal combustion motor cylinders, as authorities are all highly in favor of a light mineral oil. It is stated by Mr. Petard that if castor oil is used the piston rings must necessarily be very tight so that no oil will get by them into the combustion chambers, which will result in only the crank end of the cylinder being lubricated while the head end is left bare. In fact, it would be practically impossible to make rings but what some oil will get by them into the combustion chamber, and as pointed out by Mr. Petard that a heavy carbon deposit would be left behind; glycerine and fatty acids would also be formed by the decomposition of the oil at the high temperature found in the combustion chamber. Any temporary results which could possibly be obtained by castor oil would be accomplished by flake graphite, by putting the graphite into the crankcase mixed with oil in the proportions of a scant teaspoonful of graphite to a pint of oil, or by removing the spark plug and squirting a little graphite through the aperture by means of an insect gun. The function of flake graphite is to get right at the real cause of friction by eliminating the minute irregularities, microscopic, that exist in the metal surface by filling in the low spots and forming over all a thin, tough, veneer like coating, and if for any reason the oil supply should fail there is always the assurance that the parts may run for a long time without serious cutting or bound pistons. I advise trying this.—L. H. Snyder.

SEALING CARS FOR CONTESTS

Madison, S. Dak.—Editor Motor Age—Through the Readers' Clearing House will Motor Age advise what methods are employed for sealing the hood, gas tank, oiler, coil and other parts of a car in reliability runs? How many miles do you consider that, under ordinary circumstances, a light four-cylinder car with four adult passengers ought to get out of a gallon of gasoline and a gallon of lubricating oil?—H. H. Frudenfeld.

In sealing hoods for reliability runs a strong grade of two-wire cable, such as used for sealing the doors of freight cars, is made use of, the ends of this being secured by a lead piece which is pressed over the wires by a seal made for the purpose. The early custom of putting the wire over the top of the hood and under the mud apron has ceased, the general policy being to secure the wire through small holes drilled in the bonnet and around the frame pieces. It is often possible, where the bonnet fasteners pass through slots in the flange on the hood, that the wire can be looped from one fastener to another and sealed. In sealing gasoline tanks a small link taken from a chain is soldered onto the top of the filler cap and another on to the top of the tank, and a short piece of wire slipped through both and sealed. Coils are generally sealed with the same wire by passing the wire around the fasteners which hold the cover on and passing it over the cover. It is extremely dangerous in sealing coils to put the wire completely around the box from top to bottom because of the danger of short circuiting the wires at the bottom of the box. The

transmission, differential and other parts may be sealed by attaching this same wire with seals in the most suitable manner, which is largely determined by the design. A four-cylinder roadster carrying four passengers should get 16 miles to a gallon in warm weather and a little less in cold weather. The amount of lubricating oil used depends on the nature of the oiling system, tests having proven that some cars will make 200 miles on a gallon, while others will not average over 75. It is a safe assumption, however, that if you use a mechanical oiler carried outside of the motor a car of this capacity should average 100 miles to the gallon. On the other hand, if the oiler is contained in the crankcase and the oil is used and re-used, it is possible to get as high as 300 miles; in fact, some of the makers claim to have obtained 600 miles on a gallon.

USES 60-INCH TREAD

Leesburg, Fla.—Editor Motor Age—The Cartercar company, of Pontiac, Mich., can furnish cars with 60-inch treads, as asked for by Mr. Vrooman. I am using one of the cars and I find 61 inches the proper width, as the standard wagon tread in the south is 62 inches, and 61-inch tread with pneumatic tires will save the tires on rutty roads.—J. Y. Clark.

MERITS OF HIGH COMPRESSION

Tiffin, O.—Editor Motor Age—What are the advantages of cylinders cast in pairs or singly, or in one block? Explain the auxiliary exhaust and state which is the best, a small compression space or a larger compression space, or moderate compression. The reason I ask is that if the compression is high, the spark would jump with more difficulty than under low compression. Also, if the compression is weaker, it would take less energy to again compress the gas. On the other hand, a high compression is more powerful; so please tell me and give reason which is best.—C. L.

The casting of cylinders in pairs instead of individually is cheaper and by it simple intake, exhaust and water pipes are possible. In the early days of motoring makers followed the practice of making large cylinders, with 5-inch bore or larger, in single castings because of the expense should one break. Two cylinder castings give a lighter motor and one very stable. Casting cylinders in one block still further reduces the weight, and vastly simplifies all of the motor piping as well as gives a very much shorter engine. With present foundry art there is very little loss in making four cylinders in one casting, because the head piece is generally separate, which makes the coring very simple as well as facilitating the removal of core sand. The most suitable compression is approximately 75 pounds, cold. When higher compressions are used the pound on the connecting rod bearings is excessive and unless particularly long bearings are used they cannot withstand the explosive pressures. It has invariably happened in big road races that high-compression motors have developed troubles more than the medium-compression class. A great danger of high compression is the danger of knocking which it is very difficult to avoid. High compression will result in a little higher speed and greater power, all other factors being considered equal.

USING LINSEED OIL SOAP

Worcester, Mass.—Editor Motor Age—For the benefit of the many readers of these columns we have the following to say regarding the use of linseed oil soap for cleaning motor car bodies: Put about 25 pounds of this soap in an open-head barrel or tank of about 50 gallons' capacity, fill the barrel or tank up with water, allowing the soap to dissolve. When it is desired to wash a car, fill a pail about half full of this liquid soap and fill up the pail with water, which solution will be sufficient to wash several cars. Dissolving the soap first is by far the best method to pursue, but it is seldom a washer can be induced to do it. As soon as a car comes in from a run, the proper course to follow is to wet down the varnished surfaces with a hose and allow it to stand until the mud is thoroughly softened; this done, wash off all mud and grit carefully by playing the hose on hard. Never use a sponge or cloth for washing off the mud as it simply spreads it and causes the gritty particles to scratch the surface. Then take the previously dissolved soap and apply to the varnished surfaces of the car with a clean sponge, giving any very greasy or stained parts an extra rubbing. Before the solution dries wash off with clean water, and dry all varnished parts with a chamois. In case it is not desired to first dissolve the soap, the usual custom is to place a small handful of the soap in a water pail and fill the pail up with water and use the solution as it dissolves for washing the car.—H. P. Bagley.

USING SOAP ON CAR BODIES

Indianapolis, Ind.—Editor Motor Age—In one or two recent issues Motor Age published information on the use of soaps for cleaning motor cars, and it may be some of the following will be of assistance: Under no circumstances should any of the raw soap be applied direct to the finished body of a car. If the varnish or enamel is expected to retain its gloss and color, a soap containing alkali or caustic soda must never be used. All hard or bar soaps are made of caustic soda. All soft vegetable oil soaps are made of oil and caustic potash, and caustic potash does not injure the finish when properly used. Soda will not make soft soap and potash will not make hard soap, therefore it is up to the motorist to use nothing but soft soap. Any potash soap, if applied to the enamel, will eventually take the finish off and therefore it should always be dissolved in warm water before used. In using many soaps which are linseed oil soft soaps made of potash, one tablespoonful of the soap dissolved in a 12-quart pail of water will turn the water a soft milky white. This done, dip the sponge in the solution and thoroughly wash the body of the car. A few passes of the sponge will bring out a nice lather which removes grease, grit, weather stains, and tends to revive the original luster. Next, rinse off and dry with a soft cloth. It is a good practice to always have a pail of water with a tablespoonful of this soft soap dissolved therein in a handy place about the garage so it may be used instantly when needed. This same solution may be used on the greasy running gears, leather or rubber tops, and upholstering. The temperature of the water is of no consequence except that the soap and water should not be boiled together and ice water will not dissolve the soap as quickly as reasonably warm water. Use water that is almost at boiling point, putting the soap therein, and by the time the soap is dissolved, which is about 2 minutes, the water will be cool enough to work with. When the soap and water are applied to the enameled body, it should not be warm enough to prevent putting the hands into it comfortably.—R. Wands.

STARTING A COLD MOTOR

Fond du Lac, Wis.—Editor Motor Age—I have a 1908 Holley carbureter on my four-cylinder car. I find it impossible to start the engine this cold weather without heating the carbureter. Can Motor Age tell me how to start the engine out in the cold? I prime it with gasoline and also close the throttle, but it will not start unless I make the attempt in a warm garage.—F. G. Sternberg.

The starting of the car will be greatly facilitated by closing the air intake of the carbureter while cranking the motor. Should this not suffice get some waste, or a coarse mesh cloth, and dip it in gasoline and hold over the air intake while cranking the motor—this should greatly assist, in fact, it should insure immediate starting. There are a few cases where it has been known to fail and the only way possible was heating the carbureter by hot water. An excellent policy is fitting an asbestos cap around the carbureter, or if such is not possible, wrapping a woollen cloth around the carbureter after the motor stops will keep it warm much longer than if left exposed.

Motor Car Development

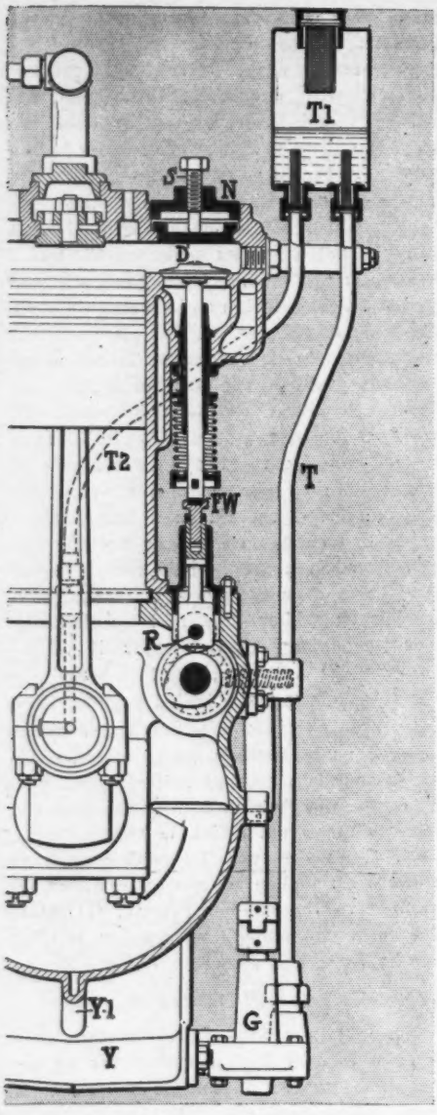


FIG. 1—END SECTION PIERCE MOTOR

THE 1909 policy of the George N. Pierce Co. is six-cylinder cars, no fewer than three models of this design being built, whereas four-cylinder construction has been reduced to two models, one of which is a town car chassis. The six-cylinder trio has been euphoniously designated six-36, six-48 and six-60, whereas the four-cylinder pair might be correspondingly labeled four-24 and four-40. This array represents three different cylinder sizes as follows:

	Bore	Stroke
Four—24	3 15-16 inches	4¾ inches
Four—40	5 inches	5½ inches
Six—36	3 15-16 inches	4¾ inches
Six—48	4½ inches	4¾ inches
Six—60	5 inches	5½ inches

Not only does the significance of three six-cylinder models out of the five augur for the future of this type of Pierce motor, but rumors are afloat that four-cylinder construction will practically cease before the end of the 1909 season. This year the company devoted its major energies to the 43.5-horsepower six, and in addition had a six-60 model, but for next year the three sixes, 36, 48 and 60, cover the entire power gamut so thoroughly that the most fastidious sixer should be satisfied. Of the newcomers in this quintette the four-24 is Tiny tot, being one of the smallest sizes yet built by this concern and being specially designed for town car and landaulet uses. The six-36 and six-48 are also new six-cylinder sizes.

Improvements in the Pierce

But Pierce energy has not all been on developing six-cylinder ideas. The car in general, from radiator to differential, has been passed under the magnifying glass and numerous improvements and weight reductions have been accomplished, but the general skeleton and design left unmolested. All five cars follow the same general lines. Foremost in the improvement code comes the introduction by the company of casting cylinders in pairs, in all but the 5 by 5½-inch sizes of the four-40 and six-60 types. The Pierce factory has until the present been a consistent exponent of the separately-cast cylinder with opposite valves, but in launching into the twin-casting field has gone a step farther by placing a crankshaft bearing between each two adjacent cylinders, using seven bearings in all instead of utilizing bearings only between adjacent twin castings and at the ends. Many makers who had every faith in twin castings found it impossible to get space between the two cylinders forming a casting for a plain crankshaft bearing, but reference to Fig. 2 on this page shows how this concern mounts three such bearings, 1, 2 and 3, making each 1¾ inch long, whereas the bearing C at the flywheel is 3 inches long, A at the front is 2¾ inches and the two intermediates B between twin castings are 2⅛ inches, giving a grand total of 15¼ inches of crankshaft bearing surface in every part of which phosphor bronze is made use of in the bushings. This motor is the second example in America of placing bearings in the positions 1, 2 and 3, but it is in conformity with a growing foreign practice, which aims at obtaining the maximum crankshaft rigidity. Each intermediate crankshaft bearing is supported through a transverse partition P, extending from one side of the crankcase to

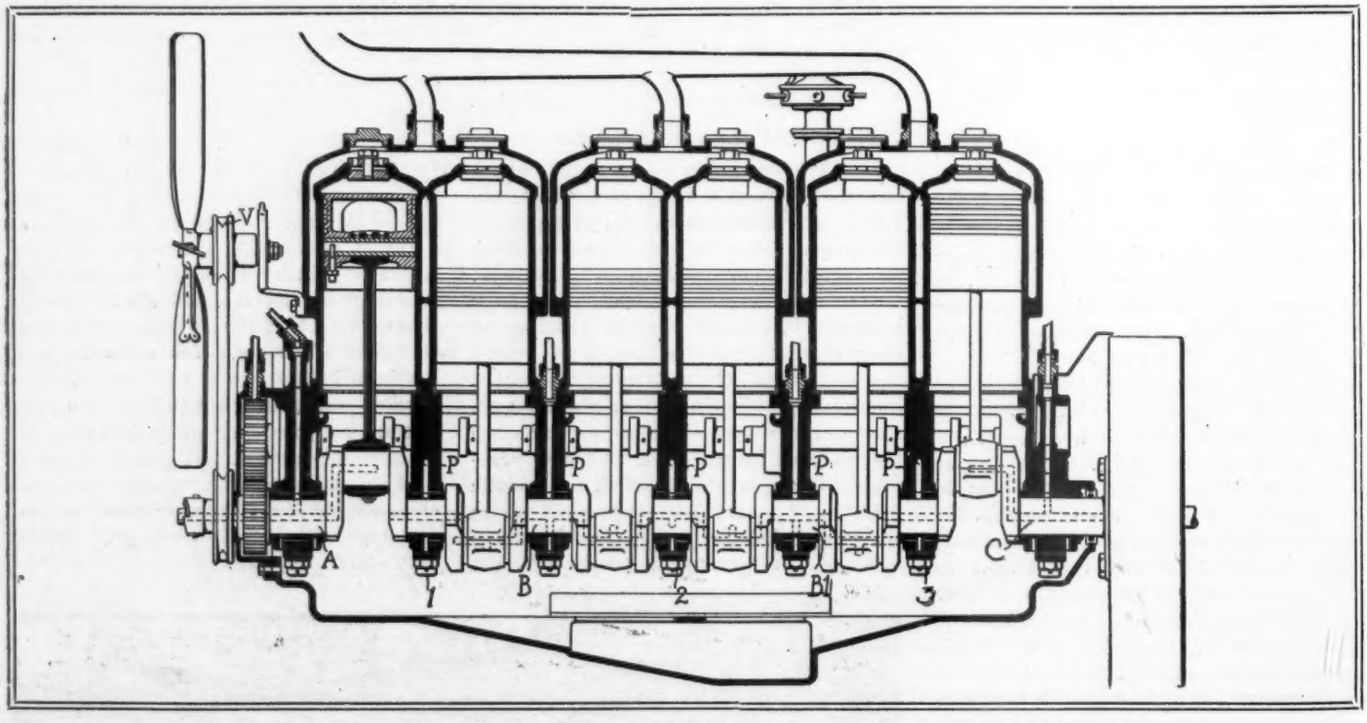


FIG. 2—PIERCE USES THREE MODELS HAVING TWIN-CYLINDER CASTING WITH INTERMEDIATE BEARINGS

Five Pierce 1909 Models

the other. This illustration shows the V fan belt, which has succeeded the broad flat type; and also a fiber endthrust bearing F on the forward end of the crankshaft where a ball thrust heretofore has been used.

Departure From Pierce Practice

A simplified vertical section of the motor Fig. 3, showing only a part of the cylinder discloses a couple of changes from past Pierce practice: One is the use of rollers R on the lower ends of the valve lifter rods for bearing upon the cams on the camshaft and the other is putting fiber washers FW in the upper ends of these lifters so as to deaden the valve-lifting noise as much as possible. The company continues the use of interchangeable intake and exhaust valves, with cast iron heads and carbon steel stems, which thread into the heads and are then riveted and brazed to insure safety. Additional motor improvements might be added, such as making the timing gears on the camshafts from fiber with bronze centers in place of previous solid bronze types; altering the intake pipe design and using a return water pipe from the jackets to the radiator top made from one piece and tapered to larger diameter as it approaches the radiator.

Speed Change Lever Moved

Not to be overlooked in the light of these motor alterations is the introduction by the company of a selective gearset and the using on all four and six-cylinder types of four forward speeds, the fourth being direct drive. Still further is the taking of the speed change lever off the steering column, where it has always been in these models and placing it at the conventional side position at the end of the footboard. Figs. 3 and 4 illustrate this set, Fig. 3 being of the set with the cover removed, showing the mainshaft S of square section with rounded corners and carrying two sliding units A and B, the former giving direct fourth speed drive by dental face teeth on the gear A. The gearshifter rods D are entirely enclosed in a lateral extension of the gearbox and have U slots into which the arm H on the inner end of the sleeve K carrying the change speed lever engages. Both shafts of the set are mounted in Hess-Bright bearings C anchored between the upper and lower halves of the case; which halves are bolted together, and in addition secured by the bolts which hold the gearbox to the crosspieces of the frame passing completely through both halves.

A particularly neat interlocker is provided and shown in the lower illustration in Fig. 3. Toward the inner end of sleeve K is attached a crescent-shaped shoe S2 with two parallel rows of holes in its face. Through the bracket W passes a rod, the end of which can engage in the holes in the shoe, and the opposite end of it secures to an arm attached to the clutchshaft. The length of this rod is such that with the clutch engaged it enters a hole in the shoe S, in which position it is impossible to move the change speed lever L, in order to change speeds, thus making gearshifting with the clutch engaged impossible. When disengaging the clutch the rod R moves forward away from the shoe S, thus, as it were, unlocking it

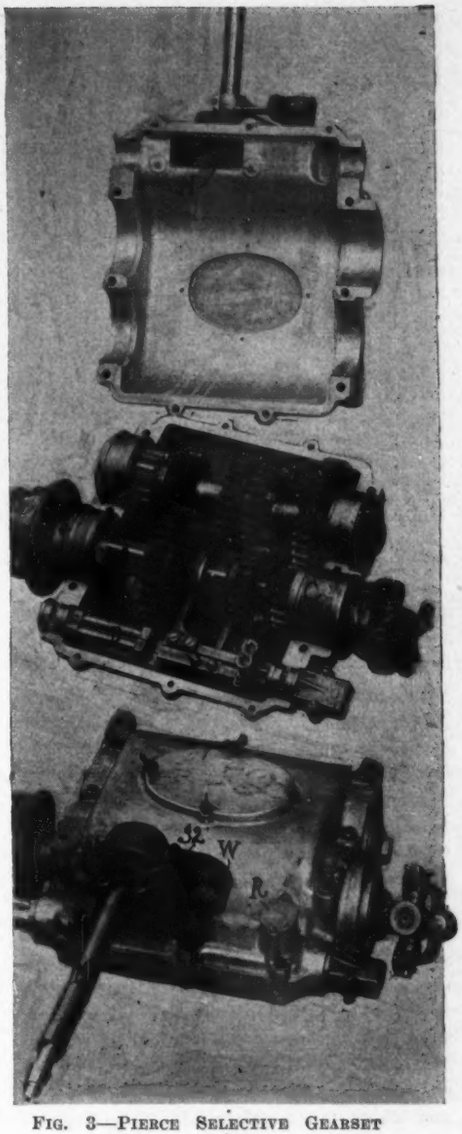


FIG. 3—PIERCE SELECTIVE GEARSET

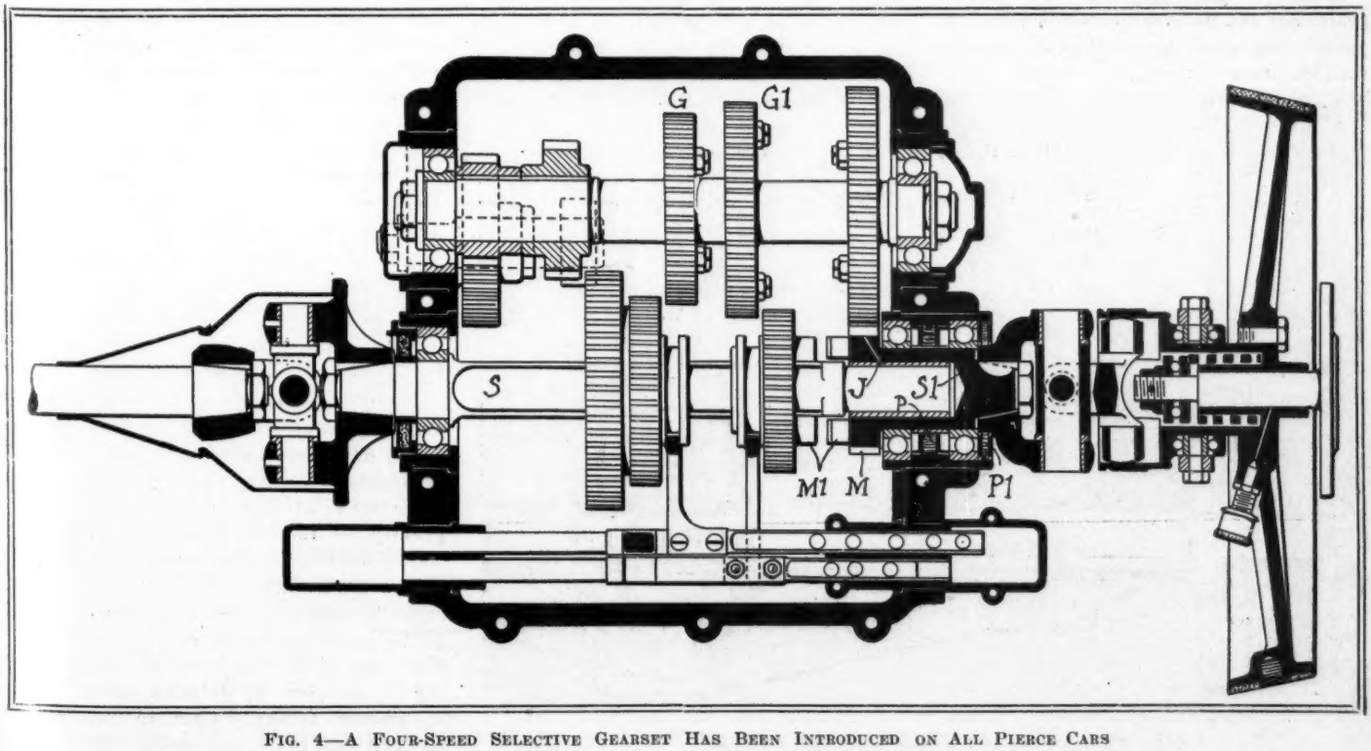


FIG. 4—A FOUR-SPEED SELECTIVE GEARSET HAS BEEN INTRODUCED ON ALL PIERCE CARS

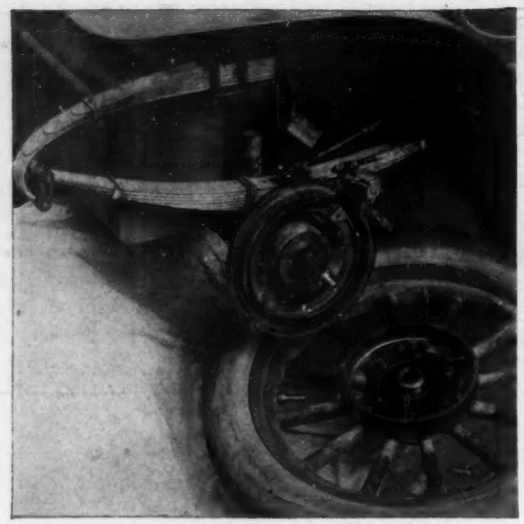


FIG. 5—THREE-QUARTER ELLIPTIC REAR SPRINGS

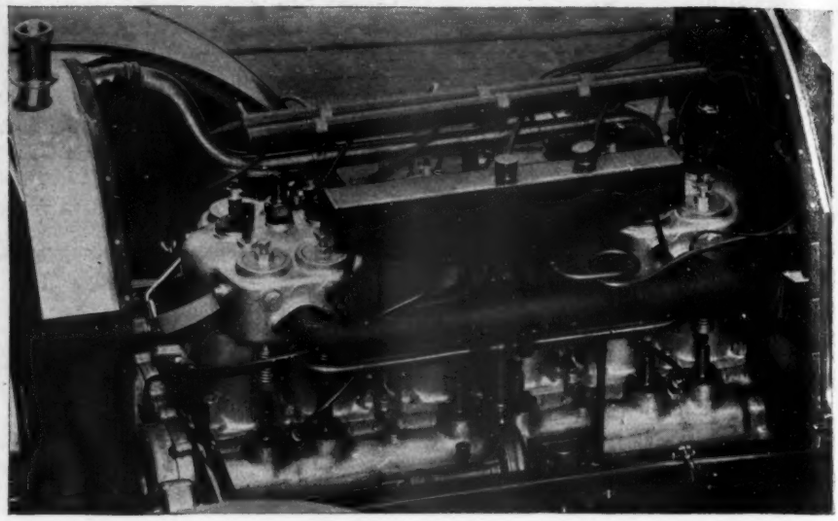


FIG. 6—GRAVITY OIL TANK AND EXHAUST MANIFOLD

and leaving it free, thereby permitting of gear shifting. The holes in shoe S only register with the hole in the bracket W, through which the rod R passes, when a gear is fully meshed, and so avoid letting in or engaging the clutch before meshing the gears.

In Fig. 4 one or two features of the new gearset appear, the short front shaft S1 carrying the pinion M1 as well as the face clutch teeth M2 for direct drive is hollowed at its rear end forming a bearing for the forward end of the mainshaft S and a special lubricating precaution for this bearing is the oil groove J, leading to the bushing. Alignment of the short shaft S1 is secured by two races of ball bearings and oil leakage prevented by packings P and P1. Both large gears G and G1 on the countershaft of the set are bolted to integral flanges on the countershaft, but the smaller gears are keyed in place. The cone clutch which connects with the gearset through a universal joint has been largely increased in width and uses a row of cork inserts which protrude through the leather facing. Ball thrust bearings are fitted at the rear end of the clutch spring and at either side of the shifting yoke. From the gearset transmission to the rear axle is through a propeller shaft with universal joint at the forward end and also at the rear. These joints are of Pierce construction and the rear one permits the necessary slip required because of the action of the rear springs.

Live Rear Axle Featured

Particularly stoutly constructed in all of the five Pierce models is the live rear axle illustrated in Fig. 7 and which is not of the floating type but has the wheels secured to the ends of the Krupp chrome nickel driveshafts W1 by a pair of Woodruff keys. Each driveshaft at its inner end carries a spur pinion, W2, keyed in position and also pressed on and the supporting bearings do not bear direct on these shafts but on the manganese bronze differential case D, which has sleeve parts D1 which take the annular ball races as well as the ball end thrust back of the driving bevel. The pinion shaft Z is supported at each end on Hess-Bright races with the forward one made dustproof by a packing V carried in the forward end of the case for this shaft. The differential housing is a two-part steel casting split vertically in the center plane of the spur gear differential, and having the axle tubes T brazed and riveted in place in it. The brake carriers B C are similarly secured to the axle tubes, which terminate at the single ball race for carrying the outer end of the axle.

An improvement in both sets of rear wheelbrakes is using facings of raybestos instead of employing bronze friction surfaces as used in 1908. The externals are lever applied, and are forged steel shoes with raybestos lining. They are pivoted at their lower ends and their tops are drawn together by a toggle arrangement. The internal pedal-applied brakes are raybestos-faced steel forgings, carried at their lower centers and cam applied. Both sets are applied through crosstree equalizers extending more than the entire frame width and working through slots in the chrome nickel steel frame side members.

The triangular torsion rod of the rear axle instead of attaching rigidly to the axle housing has the two points of attachment, one above and the other below the housing—thus spanning the differential housing—and attaching to a vertical pin, allowing each arm of the torsion bar to swivel from right to left or vice versa on this pin.

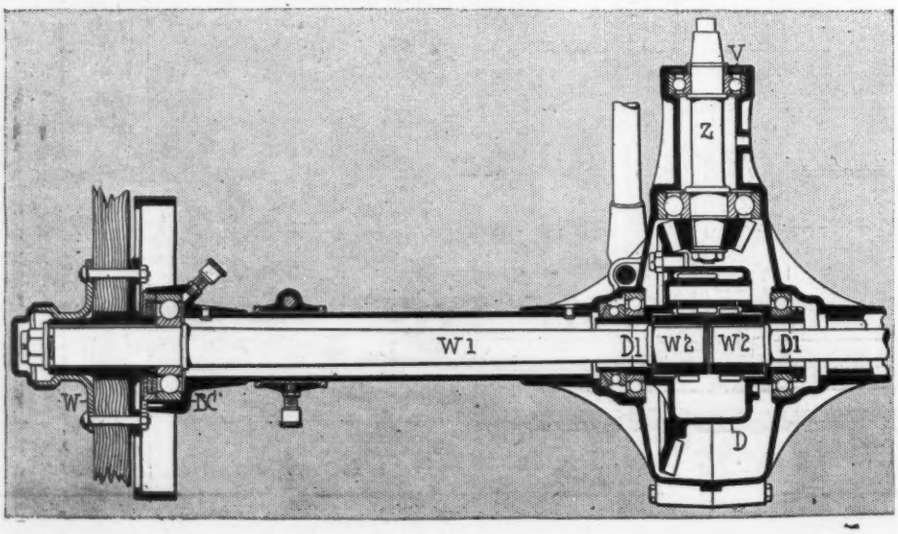


FIG. 7—NON-FLOATING PIERCE REAR AXLE DESIGN

Oiling System Remains Unchanged

The oiling system remains as at present and consists of a gear oil pump G, Fig. 1, which draws oil from the sumpt Y in the crankcase, elevating it by tube T to a large tank T1 from which it drains by gravity to the crankshaft bearings and thence through drilled crankshaft to the lower connecting rod bearings. From these it falls into the crankcase, but in falling is broken into a mist by the crankshaft and connecting rods, this mist serving to lubricate the cylinder walls, which it reaches through slots in oil baffles snapped into the open bottom ends of the

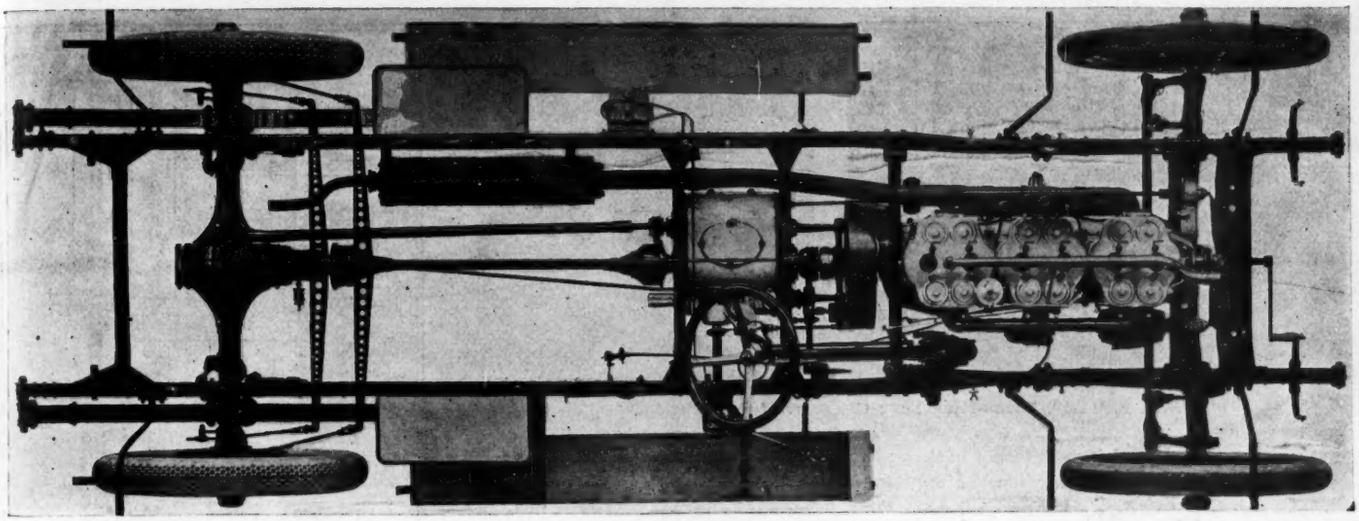


FIG. 8—CYLINDERS CAST IN PAIRS, LONG BRAKE EQUALIZERS AND SELECTIVE GEARSET

cylinders. What oil does not enter these slots finds its way through grooves Y1 in the crankcase to the sumpt Y, whence it awaits re-circulation. In each circuit the oil is filtered through fine mesh gauze twice in the gravity tank T1. From the gravity tank the oil flow is not the complete capacity of the pipes T2 to the bearings, but in each pipe where it enters the gravity tank is a restricting washer allowing a requisite oil feed, which differs according to the several bearings the pipes lead to.

In order to insure the lubrication of the wristpins, a wide, shallow groove is turned in the piston at the pin openings and three recesses are provided in the upper facing of the bearing to retain part of the oil misted within the cylinder. A slight tube on the dash shows the level of oil in the tank and with this system the entire oil supply runs out of the tank into the sumpt when the car stops, but is immediately returned by the pump, after which a definite level is maintained, there being no splash into the connecting rods dip into the bottom of the crankcase.

Carbureter Is the Same

The Pierce carbureter has not been changed during the past season, and is of the vertical spraying nozzle concentric float type, with a reed auxiliary air valve. The reed type of valve is somewhat different from the dash pot, diaphragm or spring-controlled type, and in the larger motors consists of three reeds, located vertically, fastened at their upper ends, and spaced equally arcund the cylindrical walls of the chamber. These reeds are backed by springs of varying tension, against which they contact after slight initial movement, controlled by the spring material of the reeds. Each reed guards an air opening, and—in proportion to the motor demands for additional air—do they open against the tension of the reed itself as well as the spring tension which it backs up against. The mixing chamber is water-jacketed, and a hot-air regulator is furnished, by which the amount of warm or cool air entering the mixing chamber can be regulated according to the weather conditions.

Two ignition systems are fitted, the major one being a Bosch high-tension magneto with plugs located horizontally in the valve chamber sides so that the spark occurs directly above the inlet valve. The minor system includes an Autocoil unit with current from batteries and a roller type commutator driven through a vertical shaft from the inlet camshaft. The plugs for this system are mounted in the cylinder heads close to the valve plugs. In this connection it might be well to remember that the company has increased the size of the valves this year, making the diameter ¼ inch greater, and the cams have a shorter lift than heretofore.

Illustrating Valve Covers

A rapid analysis of the cars reveals many constructions which the Pierce company have continued for several years, and which can, to a large extent, be termed exclusive with the company. One of these, illustrated in Fig. 1 shows how the valve covers are formed, consisting as they do of a disk D carrying copper asbestos gasket which is simply dropped into position; above this a nut N is threaded in place, and a set screw S forms an easy locknutting proposition. On removing this cover, it is but necessary to release the set screw, after which the nut N can be turned out by hand. This construction is used to obviate the trouble of removing closely-threaded plugs which so often rust in position. Another carefully-worked-out detail is the exhaust manifold, the aim being to set up an injector action in the flow of the gases from the different exhaust valves, as they successively discharge into the manifold, so that a partial vacuum is produced. With this object in view the company claims to obtain an increase of 5 percent in its six-48 motor, as compared with when running with an entirely free exhaust. The manifold is made with ex-

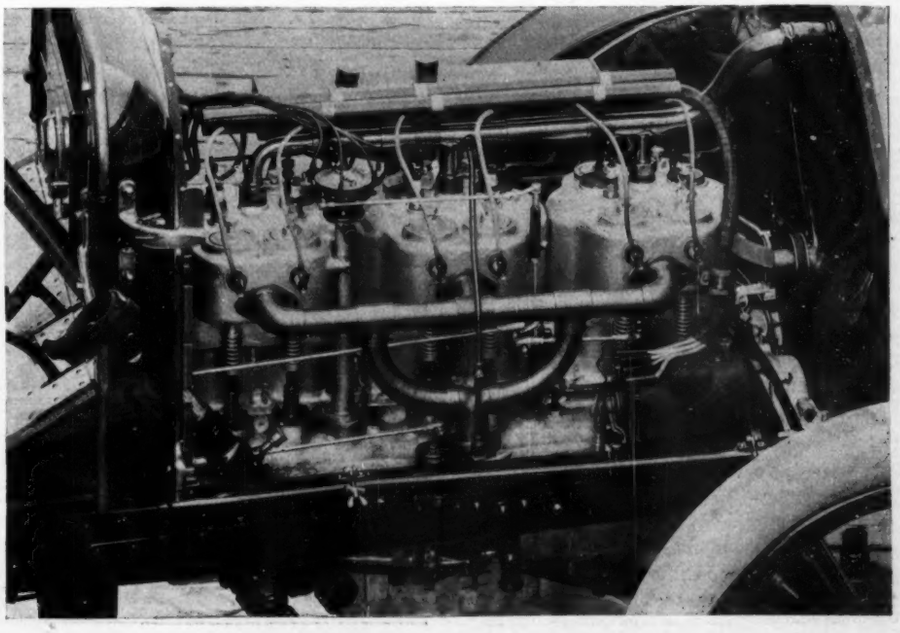
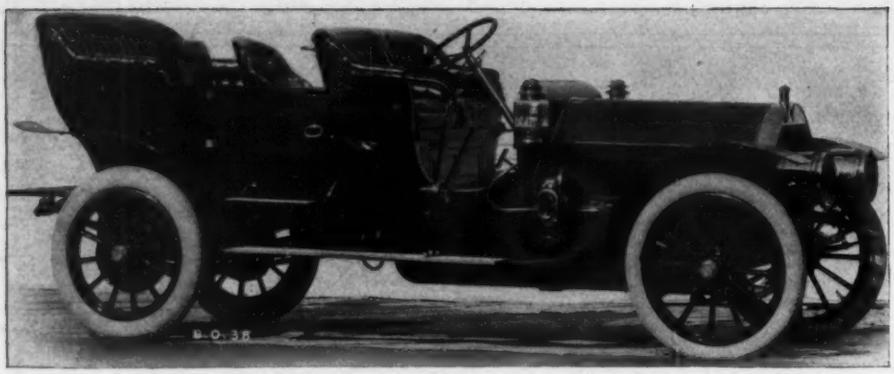


FIG. 9—NOVEL PIERCE INTAKE FOR 1909 CARS



PIERCE SIX-48, SEVEN-PASSENGER CAR WITH ALUMINUM BODY

pansion gas types slip joints between each cylinder pair to prevent strains being placed upon the cylinders which would occur were the manifold in one piece.

The company has taken a pioneer stand in the introduction of three-quarter-elliptic rear springs, while retaining the semi-elliptic in front. The characteristic Pierce type of downwardly arched I-beam front axle is retained; instead of supporting the motor through integral arms on the crankcase two forgings are used which span the frame's width and to the centers of which the crankcase bolts through bolts. Truffant-Hartford shock absorbers are fitted on all cars.

Pierce bodies are made from cast aluminum, the entire construction work, outside of the manufacture of the castings, being done in a separate department of the factory. The surfaces of the aluminum castings are carefully filed over, the first or second filing taking off the high spots, the final filing calling for particularly careful work in order to have a uniform curved or convex surface as the case may be. The several parts of cast aluminum composing the body are mounted on a wood framework and riveted together by lapped joints, each joint surface being filed to achieve a perfect fit, and the surface again filed after the union is made and the riveting completed. The company has used bodies of this type for several years, preferring it to sheet aluminum or sheet metal.

Car Specifications

The six-36 car is built with a 119-inch wheelbase and when used as a runabout carriers 36 by 3½ and 4-inch tires; when used as two, three, four or five-passenger touring styles it is fitted with 34 by 4 and 4½-inch tires. The six-48 car is supplied as a two, three, four and seven-passenger bodies, and carries 36 by 4-inch tires in front and 36 by 4½ in rear, excepting for seven-passenger accommodation when 5-inch sizes are used. It has a wheelbase of 130 inches. The six-60 with its wheelbase of 135 inches is regularly a seven-passenger car, but may be had with bodies suitable for two, three or four adult accommodation. It regularly uses 36 by 4½ tires in front and 36 by 5½ in rear. The small four-cylinder car, styled four-24, manufactured especially for brougham and landaulet use has a comparatively short wheelbase, 111½ inches. It is fitted with 34 by 3½ and 4-inch tires, or may be had with 32 by 4 and 4½-inch sizes. The other four-cylinder car, the four-40, uses 124-inch wheelbase, and is built in roadster, touring car, suburban and landau styles, it uses regularly 36 by 4-inch tires in front and 4¼ or 5-inch sizes in the rear.

CLEVELAND LINE FOR 1909

The Cleveland Motor Car Co., with general offices in New York, and manufacturing facilities in Milwaukee, Wis., announces that its 1909 car will be a continuation of the 1908 type without changes of any nature whatever. The car will be marketed in the touring car, roadster and toy tonneau types. This car has a four-cylinder motor 40-horsepower with 5 by 5-inch cylinders, cast in pairs with valves on one side. It is fitted with two complete sets of ignition, one being a Bosch high-tension magneto with plugs over the intake valves, and the other a battery and coil arrangement with plugs over the exhaust valves. The lubricating facilities are contained in the crankcase and consist of a gear-driven pump which forces the oil to the different motor parts, whence it returns to the oiler reservoir to be recirculated. The clutch employed is of the multiple-disk type, operated in oil; speed variations are through a selective set, giving four forward speeds with direct drive on the third. In this gearset both shafts are carried on F and S bearings. Both

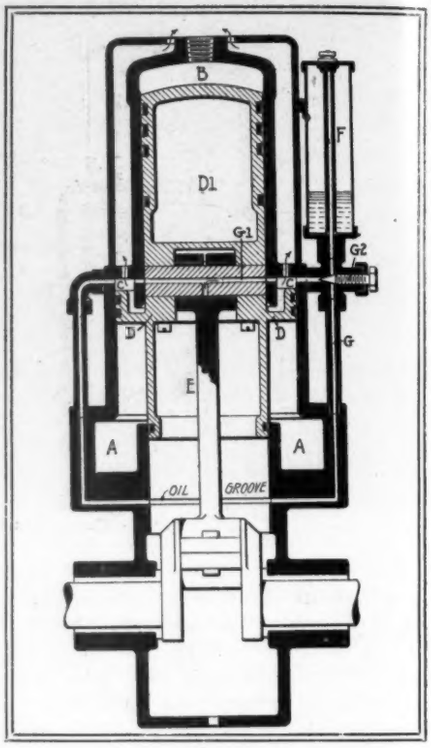
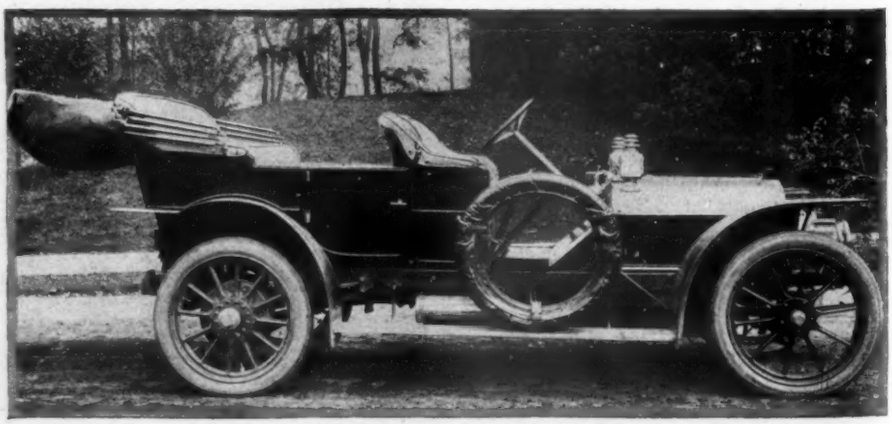


FIG. 1—LEECH MOTOR

sets of brakes are expanding members on the rear wheels, the friction surfaces being bronze against steel drums. Of note in the running gear is the arching of the side members of the frame over the back axle, which increases the flexion range of the platform spring suspension. On the touring car, which is built with a 122-inch wheelbase, 4 and 4½-inch tires are used on the 36-inch wheels, and in the roadster style with 112½-inch wheelbase, the wheel diameter remains the same, but the tire sizes are 3½ and 4½ inches on front and rear. The touring body is of the straight-line type.

LEECH TWO-CYCLE MOTOR

A particularly interesting two-cycle motor has been patented by Charles M. Leech, of Lima, O., which is of the single cylinder 4-horsepower type, as illustrated, and having 3-inch bore and 2½-inch stroke. Two vertical sections of the cyl-



THE 1909 CLEVELAND TOURING CAR

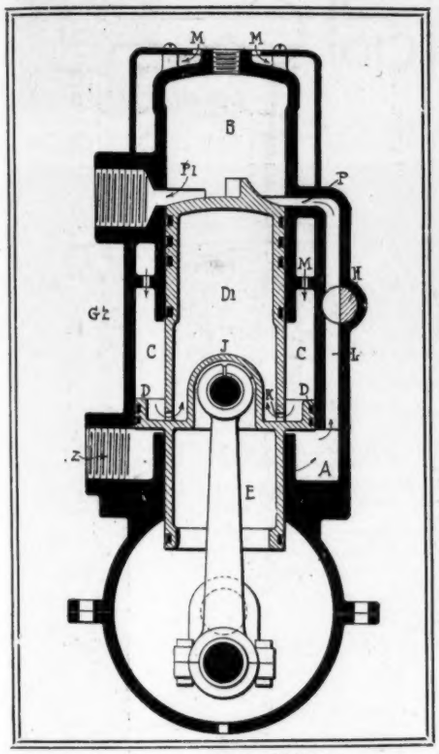
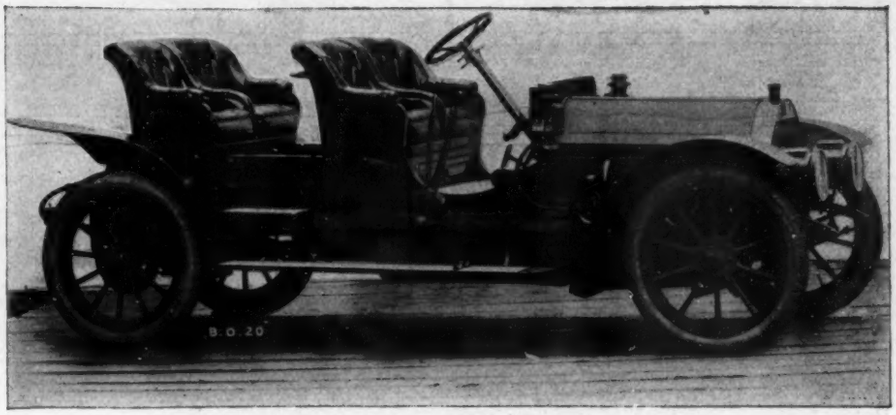


FIG. 2—LEECH MOTOR

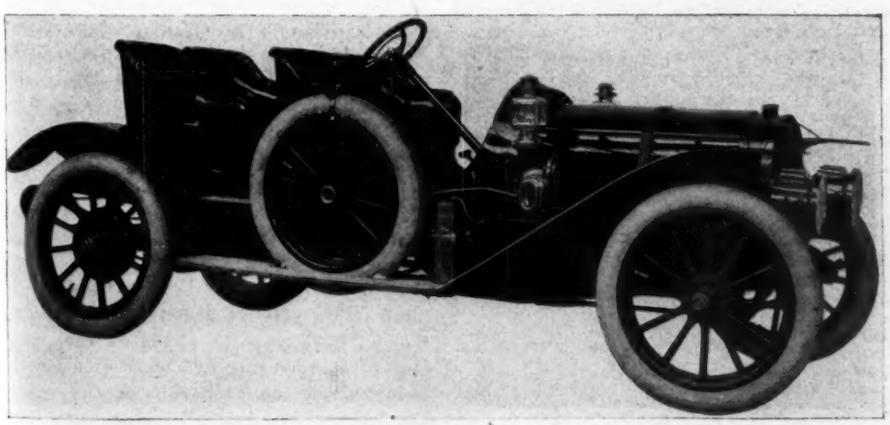
inder illustrate its general method of operation. The motor is of the tandem piston type, consisting of a working cylinder D1, and a larger diameter cylinder D, which compresses the intake charge in a ring space A, instead of in the crankcase. From this ring space, as illustrated in Fig. 2, the explosive mixture passes through a channel L in the side of the casting and enters the combustion chamber B through a port P, which is uncovered and covered by the reciprocation of the piston D1. Exhausting is through a port P1 at the opposite side of the cylinder. The passage of the mixture through the channel L is controlled by the throttle H. The operation of the engine is as follows: Starting from the end of the lower stroke, Fig. 2, the upward movement of the piston D draws in a fresh explosive charge through the opening Z, which is compressed in a chamber A on the following downward stroke of this piston. The downward stroke of the piston B forces the mixture in the compression space A through the channel L, as already mentioned, to the combustion chamber B. On the explosive stroke the downward movement of piston D draws cool air through the jacket ports M around fins which are on the sides of the air jackets. This cool air enters the jacket C through ports M and comes in direct contact with the lower part of the working piston D1. In fact it does more than this, and through the holes K in the sides of this piston enters the entire interior of it. On the upstroke of the piston the large diameter part D forces the warmed air out. By this system air cooling is accomplished. The oiling of the motor is automatically accomplished, the oil supply being carried in a pump L and delivered through grooves G and G1 to the top of the connecting rod E as well as to the cylinder walls. The oil valve G2 regulates the supply of oil going to these parts. The downstroke of the piston D draws oil from the supply tank F to the pistons, cylinders and piston pin, and the upstroke forces oil to the throttle valve H.



PIERCE SIX-48 FOUR-PASSENGER ROADSTER WITH 1909 LINES

CLOSE COUPLED RAMBLER

Thomas B. Jeffery & Co., Kenosha, Wis., have announced a close coupled Rambler model of the 45-horsepower type, with four-passenger accommodation, and fitted with the Rambler spare wheel. The bonnet, dash and fenders are practically the same as on the other models, but the two rear seats are made up little higher than the front seats; in fact, almost a perfect duplication of the front pair. The forward part of the tonneau floor board is elevated, forming a suitable foot rest and sufficient leg room is furnished. The side entrances are small with an auxiliary step. In rear of the back seats is space for a baggage rack. The color combination is Brewster green, striped in orange, with orange wheels.



RAMBLER CLOSE-COUPLED CAR WITH DEMOUNTABLE WHEEL

MOTOR CAR LITERATURE

The December 1 issue of the Co-Operator contains chapter 2 of an article on the construction of the Maxwell motor cars.

"Following the Confetti" is a photograph album illustrative of the Glidden tour which the Packard Motor Car Co. has circulated in the interests of its cars which contested in the tour. On alternate pages are original photographs depicting the Fetch close-coupled Packard in its many Glidden experiences. The book is particularly artistically gotten up.

"The Girl and the Motor," by Hilda Ward, is a 120-page cloth-covered edition published by the Gas Engine Publishing Co., Cincinnati, O. It is the story of the experiences of a small girl with a motor boat and a motor car without having any previous experience with either. The foundation of the work is the experience of the author, and the information is given in a readable manner. The book is not fiction, neither is it technical, but a semi-serious fund of information on motor boats and motor cars.

The Clason Map Co., Denver, Colo., publishes a valuable series of maps covering the states of Idaho, Nevada, southern California, Utah, New Mexico, Colorado and Wyoming. Each map, mounted on a heavy grade of linen, is approximately 3 by 4 feet in size, and folds into a paper cover of pocket size. The roads are designated by different colors, wagon roads by a double line, mountain trails by dotted lines. The usual list of routes throughout the state is not given, but the maps constitute a special valuable asset to tourists traveling in these states.

The Realm of the Commercial Car

ONE OF THE SPEEDWELL COMPANY'S HIGH-SPEED DELIVERY TRUCKS

Speedwell Delivery Truck

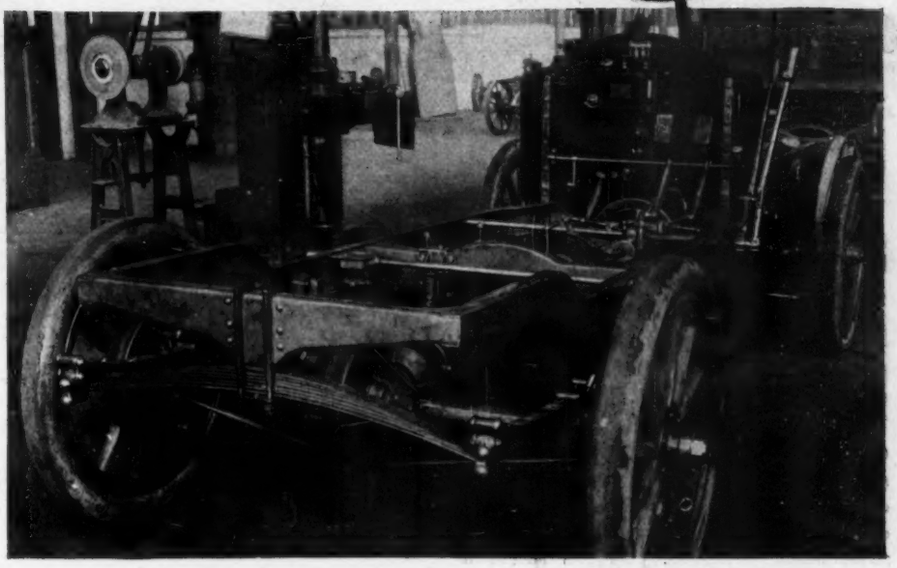
FEW would suspect a huge motor truck of being able to travel a mile on a circular track in 1:58, yet that is the feat accomplished by one of the high-speed delivery trucks manufactured by the Speedwell Motor Car Co., of Dayton, O., which recently gave an exhibition of its ability at Dayton. The accompanying illustration gives an idea of one of the Speedwell trucks, the one shown being capable of carrying a load of 3,500 pounds, although it is stated that it has packed as high as 5,000 pounds of merchandise. It will be noted that the chassis, including the driver's seat, is so built that any type of body may be mounted thereon. The driver's seat is placed over the engine and at the same time the motor is very accessible. The seat also is provided with a storm hood. Another equipment out of the ordinary on trucks is the fitting of extra large pneumatic tires, the Speedwell people claiming this gives longer life to the machinery than if solids were used. The Speedwell company's big plant at Dayton is reported to be working overtime on these trucks, so many orders for them having been received.

FOUR-WHEEL DRIVE TRACTOR, WHICH IS IN USE IN FRANCE

CHANGES IN DARRACQ CABS

A complete change of design is made on the Darracq taxicab for 1909. The gear box on the rear axle, which is one of the distinctive features of the Darracq taxi, had been found unsatisfactory for the rough work these vehicles have to perform. It has therefore been removed and placed in the usual position to the rear of the engine, and on the subframe carrying the entire power plant. The selective gear change has been abandoned in favor of the straight through type, giving three speeds forward and reverse. The most important change is in the clutch control. A broad leather-faced cone clutch is still employed, but the spring, instead of being within the cone is now inside the gear box, and separated from the clutch by means of a stout universal joint. Any slight deformations in the subframe, or a little error in lining up will now prevent the proper working of the clutch. The spring itself is contained within a stout tublar housing carrying the thrust bearing, but prevented from turning in the forward extension of the gear box in which it is housed by means of a suitable stud. The clutch pedal operates direct on the outer face of this housing by means of a couple of arms, one on each side of the shaft. The engine is slightly smaller than last year, but has undergone practically no

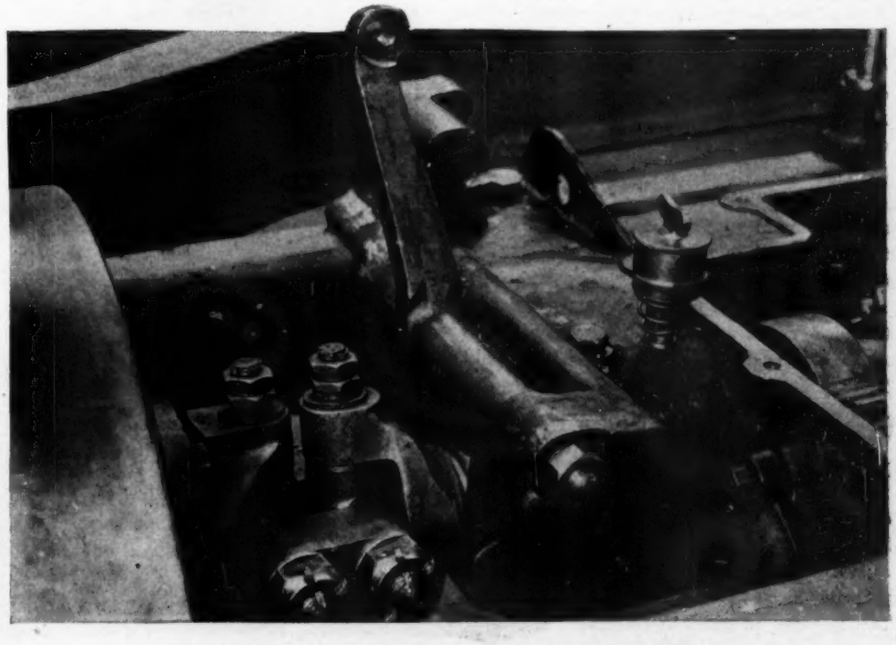
changes in design. Lubrication has been rendered automatic by the adoption of a Dubrulle dashboard lubricator positively driven off the camshaft. There are two feeds only to the crankchamber. On the previous models the flow of oil was assured by pressure from the exhaust. The engine is in one casting with valves on one side, and intake and exhaust manifolds integral. There have been a few minor changes on the carbureter, the air inlet being mechanically opened at the same time as the gas intake, in order to abolish the "panting" which sometimes occurred on opening out the engine suddenly after being throttled down. Brake connections have been simplified and are now entirely mounted on the subframe. The brake drums too, have been increased in size, and are now of the same diameter as those employed on the 60-horsepower cars. Compared with the touring models the chassis is a particularly robust construction, being considerably deeper and of broader section than any other models produced by the firm. Suspension by platform type of springs is retained on this series, though all touring cars are equipped with three-quarter ellipties. From the gear box the drive is taken to the rear wheels by means of propeller shaft, differential gear, and rear live axle, all of a much stouter construction than on the touring models.



CHASSIS OF THE NEW DARRACQ TAXICAB

TRACTORS USED IN FRANCE

In the agricultural world the French motor constructor has allowed himself to be outdistanced by the more practical and more commercial American. There are only three or four successful agricultural tractors constructed in France, and not one of them can lay claim to anything like general application. Each one has its own distinctive features and may be regarded more in the light of inventors' experiments than the machine that the farmer will receive with open arms. A newcomer to the small group has just been made in a four-wheel drive tractor, the first of its kind to be seen on the other side of the Atlantic. The motor is a four-cylinder gasoline one with separate cylinders developing about 50 horsepower. The power plant is placed in the center of a robust pressed steel frame, and transmits power forward to a gear box occupying the position usually reserved on a motor car for the engine. From the three-speed gear box a countershaft carries the drive by means of gearing to the front wheels. As the drive is through universal joints, the front wheels still retain their steering functions. From the left-hand side of the forward countershaft drive is carried rearward by means of bevel gear and propeller shaft running alongside the engine, to the rear countershaft, the final connection being by double side chains to the rear wheels. In general design the engine has little that is distinctive. The four separate cylinders are waterjacketed, have valves on one side, high-tension ignition with current supplied from storage batteries, and gasoline supply by gravity from a tank immediately behind the driver's seat. There are two radiators, one immediately in front of the engine, and one at the fore end of the chassis. The rear one has immediately behind it a ventilator fan which draws in a current of air from the bonnet which in this case only serves as a covering for the gear box. Drive is taken from the engine by means of a cone clutch at the fore end, transmitting the power to the gear box with three speeds forward and reverse. In this tractor all the work naturally comes on the transverse shaft carrying the universals and connecting up to a large pinion on each driving wheel; in addition to driving the front wheels the shaft has to transmit power to the rear wheels by means of the bevels, propeller shaft, countershaft and side chains. The engine is a slow speed one, running at about 600 revolutions a minute, and naturally gearing is very low, though no information would be vouchsafed regarding ratios. Both front and rear wheels, made entirely of steel, and of equal size, are ribbed to give traction on soft ground. At the fore end of the chassis is a broad metal pulley by means of which the tractor can be employed for driving stationary machinery with belt connection. Steering is by means of upright column and wheel, engine control is by separate levers, and gear control by the usual type of side lever. It is declared by the makers that the machine will plow to a depth of 4 inches at an inclusive cost of $2.20 per hectare, which is equal to 2⅝ acres; for a depth of 6 inches the cost is given at $4.20 per hectare; for 13½ inches the price is $8. For operating a reaper the cost is declared to be $1 per hectare. The figures, of course, are those of the manufacturer,



SHOWING GEAR BOX MECHANISM OF THE NEW DARRACQ

From the Four Winds

A. L. A. M. Show Badge

A. M. C. M. A. Show Badge

Owners Must Register—Motor Vehicle Commissioner Smith, of New Jersey, is after those owners who, employing a driver, on infrequent occasions, drive their own cars without having secured a personal driver's license. He has issued a warning, and will punish heavily any owner who so offends in future.

Improving Toledo Road—A petition is now in circulation in Toledo for the improvement of the roadway from Walbridge park for ½ mile up the river with a gravel, macadam or brick paved thoroughfare from 36 to 40 feet wide. As this road takes in one of the prettiest views in the city motorists are eager for the improvement.

Denver Climb Postponed—The hill-climbing contest scheduled for December 12 at Denver has been indefinitely postponed. Two snow storms in the last fortnight have been so heavy as to make the feat impossible—at present the snow is lying 4 to 6 feet deep in Chimney Gulch, near Golden, the place selected, and which leads to the top of Lookout mountain.

Elmira Joins A. A. A.—At a recent meeting of the Elmira Automobile Club's directors several new members were elected and membership in the New York State Automobile Association was renewed. The Elmira club has been recognized by the American Automobile Association. The club will later consider several propositions, including legislation, the placing of suitable signs in the vicinity of Elmira and the question of good roads.

Buffalo's Show Dates—It has been officially announced that there will be a motor car show at Convention hall, Buffalo, for the week beginning Monday, February 15, under the auspices of the Automobile Club of Buffalo. Late last week it was stated that another show would be held in the same hall for the week of March 1 under the auspices of the Buffalo Automobile Trade Association but plans for the March exhibition were later abandoned at a meeting of the latter organization. A feature of the session of the trade association was the election of officers for the ensuing year. Two tickets were placed in the field; one which decided to pull away entirely from the influences of the Automobile Club of Buffalo, and the other closely associated with the club. After a lively fight the ticket favoring an alliance with the club won a victory, and as a result it was decided that only the February 15 show would be held. The following officers were elected by the trade association: President, W. C. Jaynes, of the Automobile Supply Co.; vice-president, Maxwell-Briscoe-Buffalo Co.; secretary, Dai H. Lewis.

Good Roads Rally—The first annual meeting of the Minnesota Roadmakers' Association is being held in St. Paul for 3 days, commencing December 15. All persons interested in the betterment of Minnesota's roads are there. Boards and county commissioners, city and village councils, and other public bodies have sent delegations and are taking part in the discussions. County surveyors, road superintendents and road overseers are showing great interest. There is a question box and anyone who is interested in any phase of road work or road building may communicate with the secretary and latter there will be an open discussion of all questions submitted. The program includes also a discussion of road drainage, construction and maintenance, bridge and culvert construction and legislation.

Statue of Mercury for the Palace Show

Suspends Sign Work—The work of placing signboards at various points along the roads of Maryland has been discontinued by the members of the Automobile Club of Maryland pending the report of the national committee of the A. A. A. This committee has placed before the United States geological survey the proposition of a uniform road map for the entire company and will also petition contire country and will also petition congress to pass legislation to create a signboard for universal use in this country.

Motor Writer's Bereavement—Mrs. W. McK. White, wife of the motoring editor of the Evening Times, of Philadelphia, died at the home of her parents, Mr. and Mrs. John B. Dallas, 4019 Baring street, last week. She had been ill for a couple of weeks, threatened first with pneumonia and then with pleurisy and was apparently out of danger last week. The strain of the illness, however, had affected her heart and she suffered a relapse on Monday and despite all efforts of the physicians her heart refused to respond to their treatment. Mr. and Mrs. White had been married about 14 months. Her father is well known in shipping circles.

Chauffeur Is a Legislator.—Among the members elected to the legislature in Massachsuetts for the coming term is a professional chauffeur, the first man of that occupation to take a seat in the house. He is Thomas E. Davies, of Holyoke. Davies ran on the Democratic ticket in Hampshire county and he beat his opponent by 221 votes. He was a tester of machines at Holyoke and later secured a position with Mrs. Martha Ludington, of West Springfield, as a chauffeur. Davies has won much fame as an athlete and he is popular in

and about Holyoke. He is 25 years of age. Since his election he has not said much about motor legislation, but with such a man a member of the law-making body he will be able to help out in the battles that will be waged around the motor industry the coming year.

Denver's Ticket—The nominating committee of the Denver Motor Club has selected the following names for the official ticket to be voted upon at the annual election which will be held Monday, December 21. The ticket reads: President, Ralph W. Smith; vice-president, William D. Nash; secretary, Frank England; treasurer, C. P. Allen; board of governors, S. D. Hopkins, George Tritch, J. Nicoll Vroom, E. F. Dean, Ralph L. Taylor, W. H. Sharpley.

Mardi Gras Meet—The New Orleans Automobile Club has announced a race meet for Mardi Gras season, February 20, 21 and 22. The meet will be held over the fair grounds track. The feature of the program arranged by the racing committee will be a 24-hour race. Short races with cash prizes have also been offered. Owing to the passage of a law against horse-racing the citizens of the south ask for an outdoor sport for carnival time and the motor car racing is the result.

Sticks in A. A. A.—As a special inducement to increase the membership of the Automobile Club of Maryland it has been decided to award to the member bringing in the most recruits between now and May 1 a silver loving cup. The initiation fee also will be suspended until that time unless the membership reaches the 500 mark, in which case this inducement will be withdrawn. The club already has 300 members. The club decided to continue as a member of the American Automobile Association.

New Hoosier Organization—Repair men and chauffeurs of Indianapolis have organized the Chauffeur and Repair Men's Association of Indiana, and expect to make it an organization of state wide importance. At the first meeting held last week the following officers were chosen: President, S. A. Kepler; vice president, Don Aitken; secretary, Bert Corbet, and treasurer, Fred Wiltshire. Directors chosen were: Fred Willis, Charles Newby, William Strebe, Harry Moore and Minor Haywood. Club rooms are to be rented.

Will Punish Glass Throwers—The Rochester Automobile Club of Rochester, N. Y., has decided to appoint one of its members a deputy to aid in the enforcement of the law relating to reckless driving. A standing reward will also be offered for information leading to the conviction of persons guilty of stealing cars belonging to members. Those who throw glass on the streets or highways will be prosecuted. Officers will be elected on March 29, and the annual banquet of the club will be held on that date. One or two smokers will be held this winter. The expensive enameled signs used heretofore bearing directions and distances will be replaced next year by neat wooden signs. Next season's program will include monthly runs, orphans' day celebration, hill-climb, gymkhana and an endurance run.

Ohio Has New Club—A new club has been organized at Findlay, O., having for its object the promotion of sociability and the opening of a campaign for good roads in which work it will co-operate with the Toledo club, the work of which organization has been felt in all parts of northwestern Ohio. The Findlay club starts with a membership of forty-three, but by the time a permanent organization is effected there will be at least 100 members.

Gay Dog, This—R. M. Pilkington, superintendent of the Ohio Oil Co., of Indianapolis, had an exciting but unique experience with a big white bull dog. The dog, whose owner cannot be found, has developed a mania for riding in motor cars and has annoyed several drivers recently. Pilkington found the dog on the front seat of his car and when he tried to force the animal to leave, the dog showed signs of hostilities. As long as the dog was not bothered he exhibited the most friendly signs and finally Pilkington started to give him a ride. After going a few squares, the dog leaped out of the car and disappeared. Similar occurrences have been reported and the police have been instructed to try to capture the dog and place him in the dog pound until his owner can be found.

One of the Palace Show Statues

Garden Show Poster Girl

Denver's Show Delegation—A number of the members of the Denver Motor Club will charter a special car to attend the Chicago show. The party will leave Denver, Sunday night, February 7, and start on the return on the following Saturday night as soon as the show closes. This will land them in Denver in time for the opening of the show at the Auditorium in that city, Tuesday afternoon, February 16. The Denver show is to be conducted by the Denver Motor Club this year and it is the intention of the Chicago expedition to have its train decorated with Denver Motor Club banners advertising its show in February.

After Scorchers—Speed merchants in the Twin Cities who have been utilizing University avenue connecting Minneapolis and St. Paul, to their own great delight and to the wrath of pedestrians and more conservative drivers, will soon be in the toils, it is understood. The police departments of the two cities in response to numerous complaints, have decided to work together and frame up a trap which will ensnare the unsuspecting drivers. The tip is also going the rounds that when arrested, it will be a straight work-house sentence and already an improvement has been noticed along this avenue. No serious accidents have been reported of late but this fact is considered remarkable.

CRANKSHAFT MATERIALS, DESIGN AND MAKE

By Thomas J. Fay

IN THE discussion of this subject the idea will be to favor the class of materials, suspectibility of die, drop forgings, easily fashioned, affording excellent bearing surfaces, of great rigidity, with notable kinetic ability, not impossible to procure, cost of the materials to be moderate.

It will not be considered proper, however, to assume that the materials as above outlined will be those of the common present practice, since it cannot be shown that the common materials of the time are possessed of great rigidity and notable kinetic ability. This is not to say that the common crankshaft materials are without value for the purpose. The very service they render is an assurance of quality not to be attached to ordinary grades of steel. However good the run of steel may be, that is, the steel advocated and used for crankshafts, the fact remains that there are a great many failures in the course of a year. Strange as it may seem, the failures are not confined to low-priced steel; price alone does not seem to be the matter of moment.

It is a monstrous iniquity to pay $150 for a crankshaft that will last no longer than a $30 member of the same order; this is not uncommon, and it leads one to believe that the $30 kind is, after all, the better of the two. Were a person to reach a conclusion as the result of noting one, two, or, ten failures of this description, it would be hasty; unfortunately, the number of such instances to be seen at every hand is too great.

Two Primary Considerations

At all events there are two prime points of view of the crankshaft in the light of modern knowledge, that is: That involving the use of material so high in kinetic ability as to afford a long life, even though the stresses result in deflections likely to end in disaster under the conditions involving the ordinary, or even good, grades of crankshaft steel and the idea of materials so rigid in their initial status as to limit deflections under the most severe conditions to the purely nominal.

The first product, then, would be most pronounced in its kinetic ability, while the second product would be ambitious from the point of view of initial rigidity. This statement will be plain if we conceive of steel of a description such as will resist deformation to the maximum before deflecting, say, quenched tool steel, as compared with soft Swedish iron. These statements are not intended to convey the idea that the presence of pronounced kinetic ability would render it unnecessary to realize in the same steel a good showing of rigidity as well, or would it be desirable to use extremely rigid steel in which kinetic qualities would be absent. The idea to be conveyed is one taking into account rigid steel with kinetic ability as a secondary consideration, on the one hand, and highly kinetic steel with rigidity as a secondary consideration on the other hand.

To advance the theme a pace, the deflections resultant of service, considering a given extreme fiber strain, will not be of the same extent for all grades of steel, even though the unit stresses may be relatively the same, or, if the unit stresses are the same percentage of the elastic limit in the respective cases. For a given extreme fiber strain, then, the deflections may be more or less dependent upon the physical characteristics of the materials; to illustrate this point by resort to an example, which for clearness may involve the torsional shear and the elastic resistance to torsion. To begin with, the polar moment of inertia is independent of the grade of the material, because the polar moment is equal to:

$$J = \frac{\pi d^4}{32} = \text{the polar moment of inertia;}$$

in which,

$d =$ the diameter of the torsional member in inches.

For a 1-inch test piece, then, the polar moment of inertia would be of value as follows:

$$J = \frac{3.1416 \times 1^4}{32} = \frac{3.1416}{32} = 0.0981$$

= the polar moment of inertia of a round section of the diameter given.

If the polar moment of inertia is a mere matter of dimensions rather than involving the qualities of the materials used, it follows that the differences to be elucidated must be on account of the qualities residing in the materials in such a way that the several materials can be compared, using the one size, thus rendering the proof a comparatively simple matter.

Chrome and Carbon Steels Compared

In further relation to this matter it is necessary to select the materials to be compared; they might be as follows:

CHROME NICKEL STEEL

Physical properties—
Tensile strength in pounds per square inch 150,000
Elastic limit in pounds per square inch. 130,000
Elongation, per cent in 2 inches..... 12.
Reduction of area, per cent..... 33.

CARBON CRANKSHAFT STEEL

Physical properties—
Tensile strength in pounds per square inch 80,000
Elastic limit in pounds per square inch. 40,000
Elongation, per cent in 2 inches..... 18.
Reduction of area, per cent..... 36.

Taking these representatives of crankshaft materials as showing good in their respective genera, proceed thus:

On a basis of 50 per cent of the elastic limit as the extreme fiber strain in each case, and representing the same by the letter S, we have:

$S = 65{,}000$ for the chrome nickel steel.

$S = 20{,}000$ for the carbon steel.

The diameter being the same for both materials, namely, 1 inch, the value of c may be taken as $\frac{1}{2} \times d = 0.5$ inch, and with these data it will be possible to fix upon the twisting moment in each case as follows:

Chrome nickel steel:

$$Pa = \frac{SJ}{c} = \frac{65{,}000 \times 0.0981}{0.5} = 12{,}753.$$

Carbon steel:

$$Pa = \frac{SJ}{c} = \frac{20{,}000 \times 0.0981}{0.5} = 3{,}924.$$

In the two cases we have the twisting moments that would follow were the two specimens stressed to the same percentage of the elastic limits of the respective specimens. It is not possible to stop here if anything is to be shown, since the results of these twisting moments were not disclosed. If we investigate the elastic resistance to torsion it is possible the consequences of the applications will be disclosed. Considering the elastic resistance to torsion it is necessary to assign a length to the specimens. Let us assume that the specimens will have a free length of 12 inches, and that the angle due to the torsions will suffice for the purpose.

We have, then:

$l =$ length of proof = 12 inches.

$d =$ diameter = 1 inch.

$P =$ applied force in pounds at the distance a from the axis.

$Pa =$ the torsional moment. Given before for each case.

$\theta =$ angle through which the free end of the specimen is twisted, measured in arc of radius $= l$, or unity.

*$G =$ torsional modulus of elasticity, taken as $\frac{2}{5}$ E, in which $E =$ modulus of elasticity in tension.

$$\theta = \frac{32 \times Pa\,l}{\pi d^4 G} = \text{torsional angle measured in arc of radius} = l.$$

*The modulus of elasticity for tension has been assigned values ranging between 27,000,000 and 32,000,000 for steel, with 30,000,000 as a close approximation. The modulus of elasticity is regarded by the majority of steel men as the same for chrome nickel steel as it is for carbon steel; there is some doubt about this, but the proof of a difference is not at hand.

CHROME NICKEL SHAFT AFTER TEST

AUSTRIAN ALLOY SHAFT AFTER TEST

Several Particular Examples in Steel

For chrome nickel steel:

$$\theta = \frac{32 \times 12{,}753 \times 12}{3.1416 \times 1^4 \times 12{,}000{,}000} = 0.1299$$

For carbon steel:

$$\theta = \frac{32 \times 3{,}924 \times 12}{3.1416 \times 1^4 \times 12{,}000{,}000} = 0.0399$$

Having thus fixed the values of θ, let us now find the angle of torsion α—alpha—for the respective specimens as follows:

$$\alpha = \frac{180 \times \theta}{\pi} = \text{angle of torsion in degrees}$$

For chrome nickel steel:

$$\alpha = \frac{180 \times 0.1299}{3.1416} = 7^\circ\ 26.4'$$

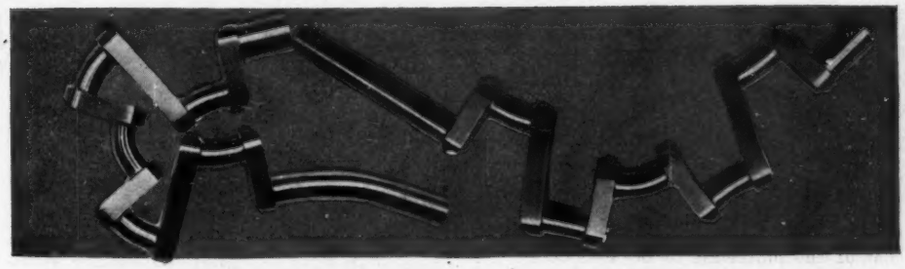
For carbon steel:

$$\alpha = \frac{180 \times 0.0399}{3.1416} = 2^\circ\ 17'$$

What do we find? Probably what most of us failed to look for in our endeavors to discriminate between the suitable products and those to be avoided. At all events it is plain that the actual deflection in degrees of arc, considering a given percentage of the elastic limit of the respective materials, is greater as the quality of material is increased, if it is true that increasing the elastic limit of the material increases the quality, which it does, from certain viewpoints at any rate.

The actual deflection in degrees of arc was found to be, in a foot of length, 7 degrees 24.6 minutes for the chrome nickel steel and only 2 degrees 17 minutes in the case of carbon steel. To glance at the formulæ is but to discover that this is all that can happen if it be true that the modulus of elasticity is the same for both genera of steel, because, with proofs of the same dimensions, and the same percentage of elastic limit, what have we but a diminished deflection in the case of the steel for which the Pa value is the minimum?

If, on the other hand, the extreme fiber strain were taken the same for the different products, then the deflection would be the same in both cases. This is to say, the high-priced material would have to be used in the same profusion as the material costing considerably less money per pound to purchase, and a great deal more to fashion into the desired shape. If it is not feasible to take advantage of the increased elastic limit of material, because by doing so the torsional angle will increase, elastic limit over and above the needs would scarcely be a desirable commodity to pay anything extra for. So far, then, the discussion has led to a very unsatisfactory state of affairs with the idea uppermost that investigation would be profitable.



KRUPP SHAFT AFTER TEST

FRENCH ALLOY SHAFT AFTER TEST

Let us add to the confusion by making the bold statement that there has in the past been a crop of crankshaft failures of the class using the finer grades of alloy steel; let it be understood, too, that the inferior carbon steel products are well represented in the land of failures. What does it portray?

On Deflections and Strains

We can begin by saying that if the modulus of elasticity is no better for alloy steel than it is for carbon steel, the deflection will be proportional to the extreme fiber strain, and the increased elastic limit of the one will be of no aid, providing it can be said that it is the deflection magnitude that must be limited. It is desirable to investigate the several grades of steel and ascertain for sure if the modulus of elasticity is the same for all, or substantially so. Then, again, it would be desirable to know if deflection magnitude is the real measure of life, or can we say the deflection is a matter of no moment if the extreme fiber strain does not exceed a certain percentage of the actual elastic limit of the material used in any given case?

In the design of crankshafts, if deflection is the matter of moment, it is only necessary to remember that the deflection, under constant conditions, is inversely proportional to the fourth power of the diameter of the shaft; the formula may be written:

$$\alpha^\circ = \frac{180 \times 32 \times Pa \times 1}{\pi^2 \times d^4 \times G} = \text{angle of torsion in degrees}$$

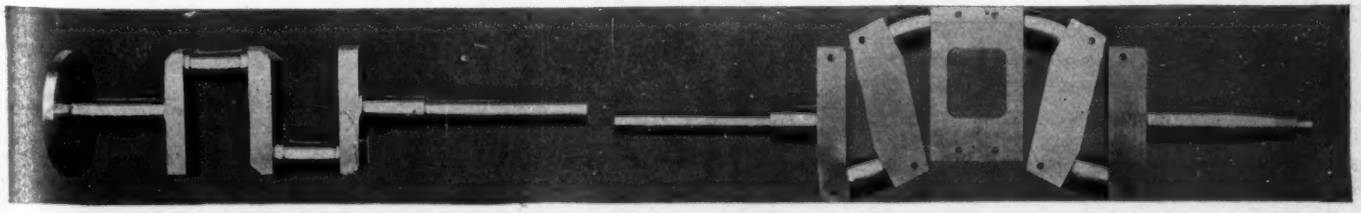
This is to say, it would require but a very slight increase in the diameter of a member to reduce the torsion angle a very considerable amount. At all events, it is possible to explode a theory so oftentimes cited by designers of even "national" reputation, who are fond of saying, "If a crankshaft is made of very strong material it will not deflect and the tendency to deteriorate will not even exist." What they mean to say is: no distortion, no deterioration. That it is their custom to use less of the high-priced material than they would of low-priced material is an assured fact. Under such conditions as have been shown here they have deflections of considerable magnitude in excess of the deflections that will actually obtain in the cases of the inferior steel of a somewhat greater, or even the same, section. It may seem odd to say that the rigid, high-priced material is likely to deflect more than the comparatively weak, and, in a sense, inferior steel, but is it really so wonderful? How about spring steel? Is it not far better than steel castings? Who will say that a steel casting will so readily deflect as will spring steel?

The steel casting can be of exactly the same composition as the spring steel; what is the real difference? In the mode of fabrication, of course. As steel castings go, 'tis a fair statement to say, the composition that produces a sound casting of excellent quality would result in a good spring; changing the mode of fabrication to suit.

In other words, good material makes good castings, or good springs. The process must suit the ultimate ends in each case, which is another way for saying, crankshafts to be good, must be of the raw materials good for the purpose, suitably fabricated.

In a spring we want high carbon, but since a crankshaft is, to be sure, the reverse of the spring, do we want high carbon? Probably not; do we want low carbon? Very likely; why?

In the first instance, the absence of carbon renders the steel easy to work and difficult to injure during its manipulation. Certainly these are good points.



BALANCED DOUBLE-OPPOSED CRANKSHAFT

BALANCED TWO-BEARING CRANKSHAFT AFTER TEST

The kinetic ability of steel is of the greatest importance if the steel is to be used for crankshafts, if it is true that the deflections may not be aborted. It is a moral certainty that the deflections do abound, irrespective of the grade of steel used in the count as herein before stated and for other reasons besides.

Low-Carbon Content Desirable

With the carbon content below, say, sixteen points, it is quite out of the question to consider that the steel will be difficult to manipulate because of the carbon content. True, it would be desirable to depress the carbon content even more under certain conditions. That is to say, if the steel is alloyed, and the physical properties are buoyed up to the desired point without the aid of carbon, or, without having to consider the tendencies of the carbon content, the lower the carbon in the steel the better it will be from the kinetic point of view. If the deflections cannot be eliminated, the greater the kinetic ability the longer will the crankshaft serve for the purpose, which is no license to increase the extreme fiber strain to any extent at all, even if the steel used has a high value of the elastic limit.

A Swedish iron crankshaft, in which the carbon might run as low as five points, would scarcely work in a manner satisfactory, primarily because the modulus of elasticity is considerably lower than that which should obtain, with the result that the section would have to be increased to a point beyond that possible in nine cases out of ten. If the section could be increased the iron shaft might be the peer of them all. It is not necessary either to employ steel high in carbon or iron so low in carbon as to affect the modulus of elasticity, if it is the absence of carbon in the iron that does account for the lowered modulus, since it is possible to so alloy steel as to render the same of considerable strength even though the carbon content may be under ten points, as it is in some of the finer grades of "cementing" nickel steel.

The fabrication of steel is one of the gerat factors in the building of motor cars, and one least understood by many of the would-be designers whose ability as metallurgists is exceedingly small. The accurate heat treatment of alloy steels is a subject deserving of the greatest care, and the proper handling of the steels calls for a steel room well equipped with pyrometers, ovens and baths, all under the direction of a competent foreman.

Motor Car Conquers Western Desert

Through the treacherous defiles of Devil's canyon, across a sandy desert marked with the carcasses of horses that, stricken with thirst, had fallen at the wayside, into the Imperial valley and then back over the same route a party of three has driven the first motor car to make such a trip all the way under its own power, it is claimed. Setting out from San Diego, Cal., in a Franklin touring car, they went up and down 4,000 feet, making the car climb over boulders and crawl about precipices. It took them a day to get through the canyon and desert and another to get back, the entire distance being 258 miles. In the party were H. M. Willard, F. E. Patterson and Wilson S. Smith, the last named of whom enthusiastically describes the escapade and its perils as follows:

"Leaving San Diego at 11:15 a. m., the run to Campo was made in 4 hours, the party stopping over night there. The next morning the start was made from Campo at 8:10. The drive to Mountain Springs was made by noon, and then commenced the treacherous descent through the Devil's canyon, which was made without a hitch, although the road is simply a creek bottom and is filled with boulders for a distance of 3 miles. After leaving Devil's canyon the desert was encountered, and for 9 miles the car plowed through sand of various depths, arriving at Coyote Wells, an oasis, where the San Diego and Arizona railroad has established a surveying camp. After leaving Coyote Wells there is another stretch of 12 miles without a habitation or a drop of water, and the road is very sandy. However, the Franklin crossed this entire stretch of 29 miles without even the aid of the chain grips.

"After crossing canal No. 8 we traveled for ½ hour over a rich loamy flat of irrigable land to the New river, which was forded without any trouble. We were then in the rich Imperial valley and could see nothing but alfalfa fields for miles in every direction. At 5:20 o'clock in the afternoon we reached Imperial, which is known as 'the heart of the valley.' The actual running time between San Diego and Imperial was 10 hours 24 minutes. The distance is 129 miles, and less than 12 gallons of gasoline was used.

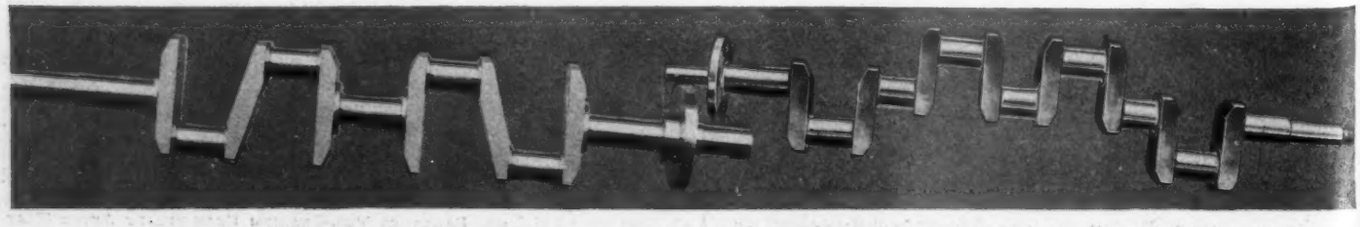
"Spending 2 days here, we set out upon our return at 4:30 o'clock the next morning. For the first 3 miles good time was made, and then began the long climb up the tortuous route by which they had come down. Crossing New river at 6:05, we were again battling with the desert sand. This time, however, the chain grips were put on the rear wheels, and the climb from sea level at the canal to an elevation of 4,000 feet was commenced in earnest. The first 12 miles was made in 1 hour 35 minutes, one-half the distance being made on the intermediate gear. From Coyote Wells the first 4 miles was made in 20 minutes, one-half the distance being made on low gear and the rest on the intermediate. The next 4 miles the road is steep, and this distance was made on the low gear in 25 minutes, and after another mile had been covered we were at the mouth of Devil's canyon.

"It was a great relief to think that the desert was again behind us and safely over as the many carcasses of horses that had dropped by the wayside from thirst were a constant reminder of the terrible things which might happen if one should get lost in a wind storm.

"Then we tackled Devil's canyon, which is no more than a creek bottom, barely wide enough for a motor car to follow, and is one succession of sand and boulders. The light Franklin showed its mettle and seemed to cling to the round boulders with a positive assurance that it would be the first motor car to make the trip from the Imperial country back to San Diego, by the way of Campo, in 1 day, and every foot of the way on its own power.

"Several times the occupants of the back seat were sure the next precipice would be too much for the machine, but each time the Franklin was equal to the occasion, and at 10:20 a. m. climbed over the last boulder to Mountain Springs, having gone the last 4 miles on the low gear and carried all three passengers practically every foot of the way.

"The fastest time that could be made during the trip was from Jacumba to Campo, a distance of 25 miles, which was covered in 1 hour 18 minutes. After a dinner at Campo the party, happy at the achievement of the 2 days, drove leisurely into San Diego, the entire 258 miles being traversed without an adjustment. It had been an adventurous trip, one that had fully tested the strength of the car and the nerve of the driver. We are proud of the feat, for it is something no one else has accomplished, but it is doubtful if any one of us would care to try it again under the same conditions."



BALANCED ALLOY STEEL CRANKSHAFT—A TYPICAL AMERICAN CRANKSHAFT

Brief Business Announcements

Pittsburg, Pa.—The Palmer & Singer Co. has opened headquarters at 912 Machesney building.

Owego, N. Y.—The Owego Car Co. is erecting a new garage, and expects to be installed in the near future.

Oskaloosa, Ia.—D. P. McClure, who has been appointed state agent for the Buick, has commenced work on the erection of a new garage.

Pittsburg, Pa.—The Acme Motor Car Co. has opened a factory branch at 354 Collins avenue, under the management of C. B. Richards.

New York—Fickling & Co. have leased the seven-story building at 304-306 West Forty-ninth street, and will enlarge its body manufacturing plant.

Pittsburg, Pa.—Wainwright & Bratton have leased the old building of the Crescent company, at 5912 Baum street, and will install a repairing plant.

Providence, R. I.—The Foss-Hughes company, which has the agency for the Pierce and Knox, is now settled in its new quarters at 27 Washington street.

Cleveland, O.—The Citizens' Taxicab Co. has been organized and will start in business the first of the year. Twenty cabs have already been contracted for.

Junction City, Kan.—R. I. Watts, of Clay Center, and M. Loeb, of this city, have formed a partnership, and will start in the motor car business. They have been appointed agents for the Buick car.

Brooklyn, N. Y.—The New York Taxicab Co. is to open a branch in this borough. Headquarters have been established at Putnam avenue and Ormond place, and W. W. Rudd is to act as manager.

Nashville, Tenn.—The Tennessee Auto Co. expects to open its new garage by December 22. The company has the agency for the E-M-F. J. J. Vertress is the president of the company, and J. K. Polk, secretary and treasurer.

Bucyrus, O.—The Bucyrus Transportation Co., recently incorporated, is to run a motor bus line between this town and surrounding villages. Several cars, with a capacity of twenty passengers have been ordered. Local capitalists are interested in the scheme.

New Orleans, La.—Plans are under way for the organization of the New Orleans Taxicab Co. The capital stock of the new concern is to be $200,000, and the entire stock is to be owned by local capitalists. The promoter of the new organization is W. E. Woodman, of New York city, who is interested in similar companies in New York, Boston, and several other cities. A site for the garage has been secured at 522-524 North Rampart street.

Harrisburg, Pa.—The Belden Motor Car Co., of Pittsburg, has increased its capital stock from $300,000 to $600,000.

Philadelphia, Pa.—The Oxford Automobile Co., of 1615 North Willington street, has been appointed local agent for the Brush.

New York—The Peerless company has purchased the property at the southeast corner of Broadway and Fifty-seventh street, and will erect a large building at once.

Harrisburg, Pa.—The Central Pennsylvania Automobile Co., which is the representative for the Buick, E-M-F, Franklin and Oldsmobile, has added the Locomobile to the list.

Redondo, Cal.—The chamber of commerce is considering a proposition made by the Pacific Motor and Automobile Co. for the establishment of a factory here. As yet no conclusion has been reached in the matter.

Indianapolis, Ind.—R. M. Hutchinson, proprietor of the Morton place garage, Indianapolis, announces he will place a line of light trucks and delivery wagons on the market next season, made from his own ideas. They will be equipped with three-cylinder two-cycle engines. He states that he will make a special effort to interest the retail grocery, hardware and other trades requiring light delivery service.

Topeka, Kan.—The Great Bend Auto Co., of Great Bend, has been incorporated with a capital stock of $10,000.

New York—The New York Automobile Coaching Co. has assigned for the benefit of creditors to Frank Ortiz, of 147 Spring street.

Pittsburg, Pa.—The Woods Motor Vehicle Co. has appointed the Bellefield Motor Car Co. exclusive agent for its cars in the Pittsburg territory.

Hartford, Wis.—The Kissel Motor Car Co. has filed an amendment to its articles of incorporation, increasing its capital stock from $100,000 to $200,000.

Detroit, Mich.—Plans have been filed for the erection of two additional buildings to the plant of the Packard Motor Car Co., and work will be commenced at once.

Pittsburg, Pa.—A. L. Banker has taken charge of the new Pittsburg branch of the Goodrich Rubber Co., which opened for business at 5900 Penn avenue, East End, December 1.

Stamford, N. Y.—The Catskill Auto Co. has been organized and will represent the E-M-F car in this city. It is to make its headquarters in the new Still garage on Water street.

Pittsburg, Pa.—Application will shortly be made for a charter for a new company to be known as the Harris Tire and Rubber Co. The company will deal in motor cars, tires, accessories, etc.

Cleveland, O.—The Zenith Motor Goods Co., 2062 Euclid avenue, Cleveland, has secured the state agency for Ke-pa-go-in leather tires. Heretofore this concern has had only the city agency.

Kansas City, Mo.—The Western Auto Top Co. has taken possession of the former quarters of the Studebaker company at Fifteenth and Forest streets, and has installed its top manufacturing plant in a big building there.

Pittsburg, Pa.—E. J. Wainwright, Jr., has severed his connection with the Union Auto Repair Co., of Pittsburg, and gone into business for himself at 5912 Baum street, East End, under the firm name of Wainwright & Bratton.

Boston, Mass.—Alfred Measure, who has been connected with Morgan & Wright, has been appointed office manager for A. T. Fuller, of the Motor Mart. Mr. Fuller has had plans drawn for the erection of a building for the mechanical department. The concern has the agency for the Packard and Cadillac.

Des Moines, Iowa—Brown-Williams Automobile Co.; capital stock of $10,000; to deal in motor cars.

Los Angeles, Cal.—Lee-Dickson Co.; capital stock $10,000; to deal in motor cars.

Albany, N. Y.—Jewell Motor Car Co. of New York; capital stock $10,000; to manufacture motor cars and accessories.

Far Rockaway, N. Y.—Savoy Auto and Taximeter Cab Co.; capital stock $30,000; to manufacture and operate motor cars, taxicabs, etc.

New York—Club Taxi Co.; capital stock $1,000; to operate motor cars.

Buffalo, N. Y.—Joseph Strauss & Son; capital stock $100,000; to manufacture and deal in bicycles, motor cars, etc.

Brooklyn, N. Y.—Plaza Garage Co.; capital stock $5,000; to conduct a garage.

Houston, Tex.—Shelp Rubber and Supply Co.; capital stock $15,000; succeeds the firm of W. B. Shelp & Co.

Buffalo, N. Y.—E. E. Denniston Co.; capital stock $30,000; to manufacture motor car bodies and tops.

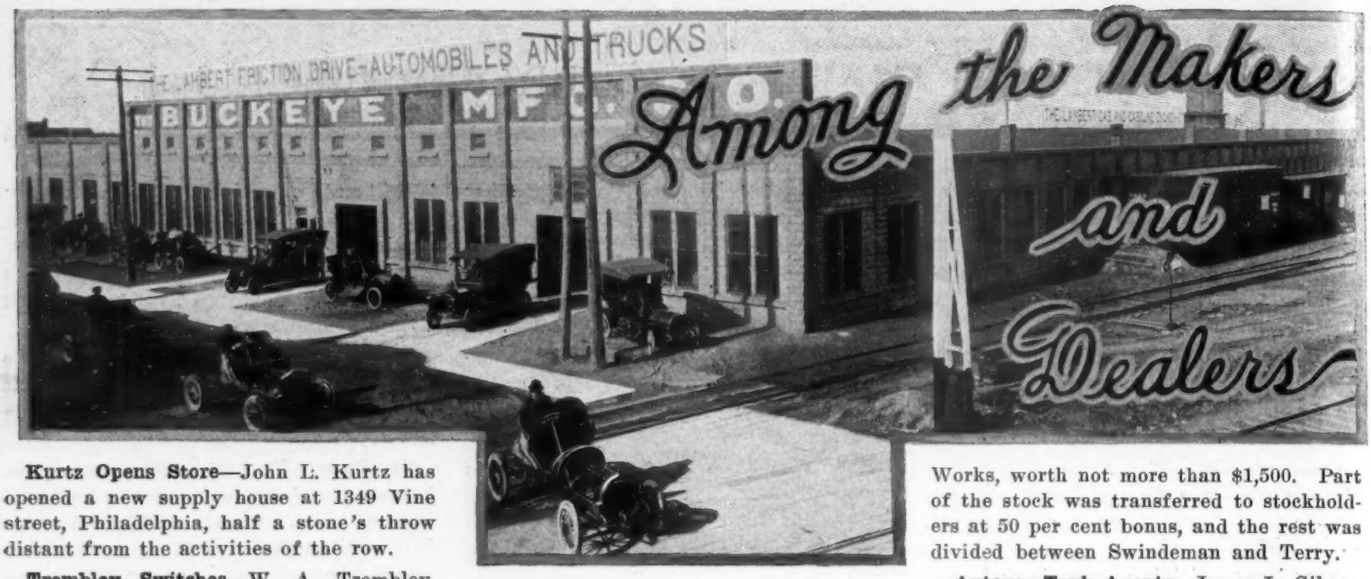
Houghton, Mich.—Twin City Motor Co.; capital stock $30,000; to deal in motor cars.

Joliet, Ill.—Economy Motor Buggy Co.; capital stock $60,000; to manufacture motor vehicles.

Perth Amboy, N. J.—Perth Amboy Garage Co.; capital stock $50,000; to do a general motor car business.

Utica, N. Y.—Iroquois Auto Top Co.; capital stock $15,000; to deal in motor cars.

Madison, Ind.—Madison Automobile Co.; capital stock $10,000; to deal in motor cars and bicycles.



PLANT OF THE BUCKEYE MFG. CO.

Kurtz Opens Store—John L. Kurtz has opened a new supply house at 1349 Vine street, Philadelphia, half a stone's throw distant from the activities of the row.

Trombley Switches—W. A. Trombley, formerly with the Buffalo branch of the Diamond Rubber Co., has severed his connections with that company to take charge of the tire and sundry department of the Iroquois Rubber Co., Buffalo, N. Y.

Kissel Recruits—The Kissel Motor Co., of Chicago, has appointed the following agencies for the Kissel in its territory: Johnston Automobile Co., Marshalltown, Ia.; Jacob Razor, Bloomington, Ill.; William Killmer, Ashton, Ill.; Julius Sander, Davenport, Ia.

Changes in Cleveland—Harry S. Moore, Stoddard-Dayton dealer in Cleveland, has taken the agency for the Brush runabout. E. P. DeCollier, who has been connected with the Cleveland branch of the Oldsmobile since its inception, has made a change and is now enrolled under the Thomas banner, having joined the Auto Shop Co. forces in Cleveland. He will sell both Thomas and Selden cars.

Cole Will Build Cars—After experimenting for some months, the Cole Carriage Co., of Indianapolis, has decided to build a car which will be equipped with solid tires. The engine will be of a two-cylinder four-cycle type, developing 14 horsepower. Bevel gear drive will be employed. Three models will be manufactured, the same type of chassis being used in each, and will consist of a runabout, a car equipped with a double rumble seat and a touring car with a detachable tonneau.

New Engine Concern—P. J. Holm, formerly superintendent of the Northwestern Steel and Iron Works Co., of Eau Claire, Wis., has resigned and will go into the motor and engine manufacturing field. Mr. Holm has organized the Holm Machinery Co., incorporated under the laws of Michigan, capital stock $100,000, and will build a large factory at Sparta, Mich. The plant will consist of a foundry, 200 by 200; machine shop, same dimensions; shipping house, pattern shop, and storage building, 50 by 100 feet, with a testing shop of the same dimensions. Mr. Holm expects to employ 400 men from the start. He has secured services of a number of the best mechanics of the Northwestern works at Eau Claire.

Mossberg Co. Takes New Line—The Auto Cle wrench, formerly manufactured by the Quincy-Manchester-Sargent Co., is now made by the Frank Mossberg Co. Distribution of the Auto Cle and Titus Cle wrenches will be made from the Frank Mossberg Co.'s office and factory at Attleboro, Mass.

Brunn Takes Franklin—The H. H. Franklin Mfg. Co. has closed a contract for the handling of its cars in Buffalo with the Brunn Automobile Co., which as the Brunn Carriage and Manufacturing Co. has a long established business at 1140 Main street. Mr. Brunn will sell the Franklin exclusively.

Sheboygan's Big Garage—The Wilke Automobile and Machine Co. has been organized at Sheboygan, Wis., and has opened a shop and public garage on Jefferson avenue, between Seventh and Eighth streets. The garage is said to be the best equipped in Wisconsin outside of Milwaukee.

Trustee After Stockholders—Joseph W. Lane, trustee in bankruptcy of the Craig-Toledo Co., of Toledo, has filed a suit in common pleas court to recover from the stockholders approximately $30,000 to pay the debts of the concern in full. Lane alleges that the debts aggregated more than $45,000 and the proceeds of the assets amounted to but $16,000. He asks that the court ascertain the solvent stockholders and the amount of unpaid stock subscriptions due from each and assess upon them the amount needed to pay the debts in full. Lane claims the company was organized at $100,000, and that $51,000 worth of stock was issued to Swindeman for assets of the Maumee Motor Car Works, worth not more than $1,500. Part of the stock was transferred to stockholders at 50 per cent bonus, and the rest was divided between Swindeman and Terry.

Autogas Tank Agents—James L. Gibney & Brother, 211-213 North Broad street, Philadelphia, have been appointed sole agents for the Autogas tanks in Philadelphia and adjacent territory.

Has Knox in Rhode Island—The Knox Automobile Co. will be represented in the state of Rhode Island by the Hitchcock-Banks Motor Car Co., 179 Aborn street, Providence, R. I.

Solliday Handling Strombergs—The Solliday Motor Car Co., of Milwaukee, agent for the Overland, Wayne, Welch and other lines, has been appointed state agent for Wisconsin of the Stromberg carbureter.

Newman Goes South—C. A. Newman, formerly connected with the Atwood Automobile Co., of Toledo, and later with the Sid Black Automobile Co., of Cincinnati, has made arrangements to become manager for Guy E. Blackwelder, Franklin dealer at Oklahoma City, Okla.

Newby in New Concern—The Independent Automobile Co., recently organized in Indianapolis to handle the Oakland, has gone out of business, the room being taken by the Indiana Automobile Co. C. R. Newby, one of the organizers of the Independent company, has purchased an interest in the newly organized State Automobile Co., 415 Massachusetts avenue, and that company will have the Oakland agency next season. Newby was the Oldsmobile representative in Indiana during the last season.

Double Century Car Busy—The Chalmers-Detroit which traveled 208 miles a day for 100 consecutive days between August 9 and November 17, a total distance of 20,800 miles, has been shipped from the factory at Detroit to the Carl H. Page Co., Chalmers-Detroit dealer in New York city. The double century car will be used in New York for demonstrating purposes and to show to prospective buyers the action of the car after its long journey. After the car has been used in New York for some time it will be sent to Philadelphia, Boston and other eastern cities. This

is the second car of model F type the Chalmers-Detroit Co. completed. It has been run more than 6,000 miles through middle western states before it was started on its "208 miles a day for 100 consecutive days test."

Handling Jewels—The Forest City Motor Car Co. has closed new agency contracts for 1909 with the following: The Rhodes Implement Co., Kansas City, Mo., for western Missouri, Kansas and Oklahoma, and W. M. Kidwell, Savannah, Ga., for Savannah and vicinity.

Big Magneto Shipment—The Remy Electric Co., of Anderson, Ind., manufacturer of the Remy magneto, recently shipped a full carload of magnetos to one of its customers, the Buick Motor Co., Flint, Mich., claimed to be the largest single shipment of magnetos ever made.

Making Wheels—The Turnbull Wagon Works, of Defiance, O., one of the oldest and most reliable of the concerns of that city, is installing machinery for the manufacture of motor car wheels on an extensive scale. The machines are of a new type, the invention of George A. Ensign, an employe of the Defiance Machine Works.

Milwaukee Growing—The Wisconsin Automobile Exchange, state agent for the Stearns and Midland lines, has moved to its new and permanent quarters at 239-241 Wisconsin street, Milwaukee, adding another big agency garage to the east side motor row in Milwaukee. The repair line will be a specialty. A public garage will be maintained.

Ostendorf Turns Bison—George Ostendorf, for the past 2 years a traveling salesman for the H. H. Franklin Mfg. Co., of Syracuse, has left that company to become secretary and general manager of the Brunn Automobile Co., of Buffalo. The latter company as the Brunn Carriage and Mfg. Co. has a long-established business at 1140 Main street. It will handle the Franklin motor cars in Buffalo during the 1909 season. Ostendorf will have full charge of the sales. While with the Franklin company he has traveled in New York and Pennsylvania.

Factory in Baltimore—The Carl Spoerer's Sons Co. has started a motor car factory in Baltimore. The company is manufacturing a large car known as the Spoerer, of two decisive models, one a tourabout and the other a five or seven-passenger Pullman body car on the same lines as a Stearns car. Several of these cars are on the streets but have not yet been placed on the market, the company desiring to give them a thorough test. The Spoerer car is a four-cylinder machine and the company announces that it expects to put out at least twenty-five of these during 1909. The Spoerer concern also will manufacture motor car trucks and engines, while it also is a jobber in tires and engages in the tire repair business. The factory is located at 901-909 South Carey street. The tire branch office has been established at 881 Park avenue, which place will also be used as the motor car salesrooms.

New Job for Harkins—Jack Harkins, who drove the Chadwick entry in the Fairmount Park founders' week 200-mile race, has joined the sales force of the Harris Tire and Rubber Co., Broad and Race streets, Philadelphia.

Chalmers Agent Moves—The Chalmers-Detroit Automobile Co., Indianapolis, has moved from 415 Massachusetts avenue, to 11 West Market street, in the heart of the downtown business district. Next season in addition to the Chalmers-Detroit, the company will have the Indiana agency for the Pierce-Arrow. The quarters just vacated at 415 Massachusetts avenue will be occupied by the State Automobile Co., agent for the Oakland and the Capital Auto Co., top manufacturer.

Chalmers-Detroit Stunt—Each Chalmers-Detroit agent has arranged a unique window display, which consists of a crankshaft—one of the two-bearing kind used on the Chalmers-Detroit 30—which has the blades of a radiator fan attached by means of a bracket to one end of the shaft. A yard away from this an ordinary electric fan runs at low speed, thereby throwing a gentle breeze on the crankshaft, which is kept whirling with watch-like smoothness. This display demonstrates the easy running construction of the shaft.

Wants to Buy Truck—Members of the board of public safety, Indianapolis, have decided to purchase a gasoline motor truck for the use of the Gamewell fire alarm and telegraphs system of the fire department. The truck is to cost not more than $1,600, as that is all of the money the board has available. It has been found that if a gasoline truck is not purchased, a new crew of two men with a horse and wagon will have to be added to the work, whereas with the truck all of the horse-drawn equipment can be dispensed with.

Building in Syracuse—The New Process Rawhide Co., Syracuse, N. Y., manufacturer of New Process pinions and cut gears of all kinds, is about to construct a considerable addition to its present plant. The company has been operating its plant nights for 2 months and has at the present time the largest payroll in its history. The new addition, for which contracts already have been let and which is now under construction, will consist of two stories and a basement, 60 by 80 feet, extending east on Plum street from the company's present plant. The construction is to be of steel and brick with cement floors and will increase the available floor space by over 13,000 square feet. The cost of the new building complete will be from $25,000 to $30,000 and the company has machinery on order for delivery during the next 2 months approximating $12,000, consisting principally of automatic turret lathes, bevel gear planers and grinding machines. An additional hardening furnace for treating transmission gears and drive gears also will be installed.

Agency for Lascaris—Emanuel Lascaris, one of the de Dion crew in the New York-Paris race, has taken the Browniekar agency for Chicago. He is located temporarily at 1240 Michigan avenue with the Gunther company.

Another Gotham Recruit—The Trenton Rubber Mfg. Co. has opened an office and salesroom at 1997 Broadway, New York city, made necessary by the rapid increase in its business, particularly so on the inner tubes and thermoid brake lining.

Big Buckeye Plant—The plant of the Buckeye Mfg. Co., at Anderson, Ind., where the Lambert is made, occupies 80,600 square feet of ground. Five hundred men are employed there making 1,000 cars for 1909. It also is intended to manufacture 200 trucks next year.

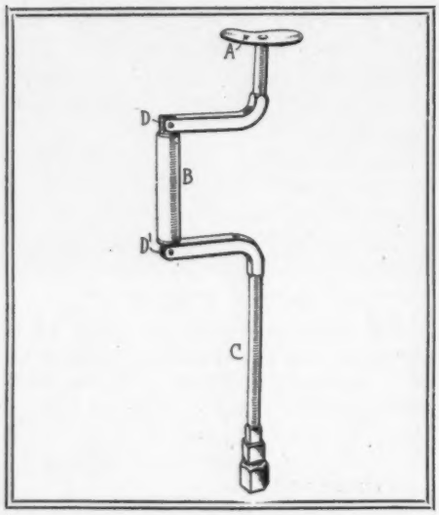
Benz Invades America—A deal has been made whereby the Benz invades America, the Benz Auto Import Co., 159-1601 Broadway, New York city, having been given the exclusive agency and sale rights for America. Jesse Froehlich, managing director and treasurer of the Times Square Automobile Co., of New York and Chicago, is at the head of the importing concern.

Win Breslin Plum—The annual luncheon given the New York tradesmen by the Hotel Breslin was well attended, interest being centered in the drawings to see which cars should be placed in the Breslin foyer during each of the two big shows. The Pennsylvania won the honor during the palace show, while during the Madison Square garden affair the Haynes will be on view.

Badger Transfer—The American Motor Car Co., of Eau Claire, Wis., has filed an amendment to its articles of incorporation in Wisconsin, changing the name to Burdick Motor Car Co. and decreasing the number of its directors from five to three. This is the formal transfer of the American company's business to the new company headed by Ralph M. Burdick, of Eau Claire, which will manufacture the Burdick line of motor cars.

New Rubber Company—The Standard Tire and Rubber Co., with offices and salesrooms at 102 Portland street, Boston, and warehouse at 84 Chardon street, Boston, will soon announce the opening of its uptown branch, to supply the increasing demand for the Federal tire. William P. Cronin, formerly manager for the Diamond Rubber Co., at Boston, is president, and James S. Waddell, treasurer. The tire is made by the Federal Rubber Co., of which sales manager; Otis R. Cook, for 12 years with the B. F. Goodrich Co., will be man- Osborne S. Tweedy, for years Chicago manager for the Diamond Rubber Co., is identified with the concern.

Development Briefs



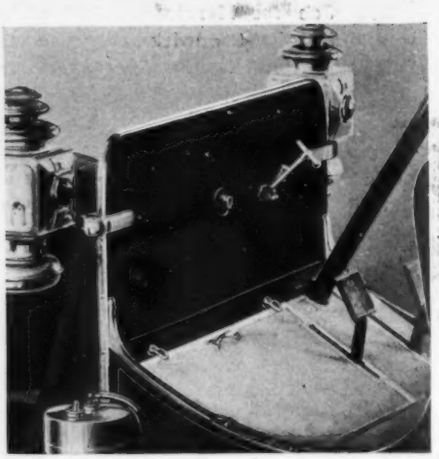
TITUS CLE WRENCH

IMPROVED RAYMOND BRAKE

The Royal Equipment Co., Bridgeport, Conn., manufacturer of the Raymond brake, shows improvements in this brake from year to year, and for 1909 the leading improvement is using a thumb nut on the adjusting screw instead of lock nuts previously used, the thumb nut being a ready method of adjustment. A further improvement on brakes for high-powered cars is the use of a special lever which allows of holding the heaviest and highest-powered cars from either forward or backward movement. This new lever arrangement, together with ray-bestos facing on the band is looked upon to insure a high safety factor in connection with the brake. In operation the rod connecting with the pedal or lever connects with a part A which is pivoted to the top end of the lever B. The lower end of this lever attaches to the brake band and also to the swinging arm C, which is the brake carrier support. The other end of the band couples through the adjusting arm D with the lever B at a point F close to its lower end, so there is a long leverage arm between F and the connection A, thereby giving ample power for applying the brake.

TITUS CLE WRENCH

The Quincy-Manchester-Sargent Co., Chicago, is manufacturing the Titus Cle wrench, illustrated herewith, and which may be considered a little brother of the Auto-cle, a wrench manufactured by the same makers and which has been on the market for some time. This wrench is of the off-set type, with the breast or hand plate A on the end swiveled, allowing the handle part B to be turned without any unnecessary pressure. The wrench is made with a particularly long shaft C so that it can be used for getting inside cylinders or

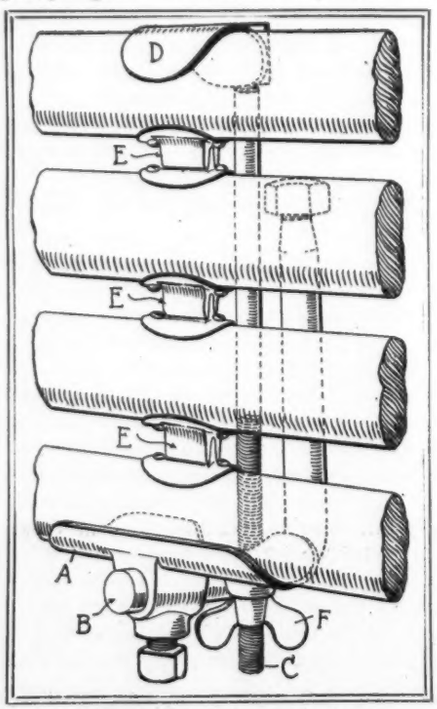


THE CLEAN 1909 FRANKLIN DASH

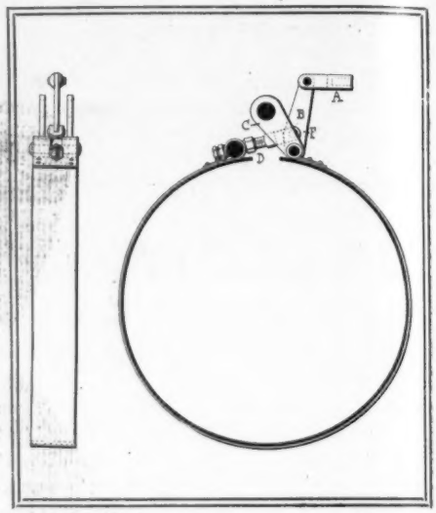
removing and adjusting transmissions and other parts in which nuts are in inaccessible locations. The wrench is provided with seven sockets, intended to fit sizes of nuts and bolts such as used in motor cars and motor boats. These sockets are made of cold-drawn pressed steel, and are particularly thin, allowing of their use in intricate places. The handle of this wrench folds at the points D and D1 allowing of its being carried in a small case along with the seven sockets.

EVER-TIGHT BOW REST

The Garage Equipment Co., Milwaukee, Wis., manufactures a clamp bow rest to be used on the tops of motor cars when down to prevent rattling of the bows one against the other, and to hold them compactly together. As illustrated, it consists



EVER-TIGHT TOP BOW REST



IMPROVED RAYMOND BRAKE

of a perch or support A, secured to the hanger B by a set screw, and in which 5-inch perch the bottom bow rests. On the inside of the perch is a lug through which passes the anchoring bolt C, with a wing nut on the bottom of it, and the top passing through the top clamp D. On the bottom of this anchor is a nut with spring washer. Between adjacent bows may be used separators E of polished brass, which are separated from the bow clamp and which are for the preservation of the bows.

FRANKLIN RUNNING BOARD

A running board shield that does not make, between running board and shield, a pocket in which to accumulate mud and dirt is something new in the 1909 Franklin. This is said to promote neatness and to be lighter than the shields which enclose the entire space between the running board and the sill. The feature of the shield is that it turns in at the base, leaving an opening, instead of being closely fastened at the running board.

BRING OUT NEW WHEEL

Patents have been granted to Alexander Nisbet, Thomas Baird and Edward Dettlebach, of Denver, for a motor car wheel which is said to combine the pneumatic and cushion tire. The pneumatic tire does not come in contact with the ground, but is encased within the cushion tire. By this arrangement the hope of the manufacturers of the wheels to find some invention by which the liability of the pneumatic tire to puncture can be counteracted, while its resiliency is retained, has been achieved, it is claimed, for by placing the pneumatic tire within the cushion all the resiliency of the former is retained, and the non-puncturable cushion tire receives all the shock of any obstruction.